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ORIGINAL COMMUNICATIONS.

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SYMPOSIUM: Sinus Disease.*

American Laryngological Association.—Atlantic City Meeting.

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Comparative Results of Conservative and Radical Methods of Treatment of Disease of the Sphenoid Sinus.

By T. PASSMORE BERENS, M.D., New York.

THE MAXILLARY SINUS.*

By ROBERT C. MYLES, M.D., NEW YORK.

The symptoms that demand radical surgical intervention vary so much in the individual cases of diseases of the antrum that it would require hours to describe them accurately and properly. To be as brief as possible, one will have to make many epitomized statements.

* Read before the Twenty-seventh Annual Congress of the American Laryngological Association, held at Atlantic City, June 1 to 3, 1905.

In the writer's opinion, radical surgery should be employed:—on nearly all cases of exposed bone necrosis beneath the periosteum and at the roots of the teeth; on all cases of extensive polypoid changes in the mucosa—chiefly indicated by a very large and protruding lip of the hiatus semilunaris, associated with chronic ethmoiditis; on all cases of osteomyelitis—which is usually evidenced by a discharge of a peculiar offensive wine-colored secretion which upon irrigation fills the returning fluid with small black particles of putrid debris of blood. Nearly all cases of neoplastic growth require extensive radical surgery. The earlier and more complete the surgical procedures, the more favorable the results will be.

It is in the long-standing cases of purulent and muco-purulent discharge, with all their varying degrees of activity that we are often baffled as to the conscientious course to pursue. Foul-smelling pus of a mealy character when mixed with water, is not a symptom that always demands radical surgery. The writer after having performed several hundred operations through the canine fossa and malar ridge and more or less thoroughly curetting the antral walls, has practically abandoned the procedure and has on several occasions warned the profession against over-curettage of the edematous membranous walls, unless provision is made for a permanent opening from the antrum into the nose through the inferior meatal wall, in order that drainage and free ventilation may take place, while the walls denuded of the internal vestments may at best slowly cicatrize and in a measure reproduce themselves.

In regard to the comparative results of conservative and radical methods of treatment:—Radical treatment is supposed to remove the pathologic condition as well as the cause or root of the disease, and to leave no cause for a future diseased condition. I have experimented for years with conservative and radical methods and have tried to be fair to the patients and to the respective methods. The irrigation method through the normal opening was carried out during a series of years on certain classes of cases, some on account of the demands of the patients and others for scientific reasons. A number of patients were cured but the treatment was too slow and too uncertain to merit more than occasional favor. As above stated, the operation through the canine fossa and malar ridge has been abandoned in the ordinary suppurative cases. Such good results have been secured in this class of cases by a conservative operation that the writer, in almost every case, uses it as a curative procedure or as a preliminary operation to the canine fossa one.

This conservative treatment consists of an operation with curved

chisels which cut going in and coming out, with the use of the rongeur forceps, and with the occasional aid of the electric trephine. As much of that part of the antro-nasal wall which is situated within the inferior meatus is removed as possible, and in certain cases it is best to remove a part of the inferior turbinate. After irrigation the cavity is carefully curetted with the malleable-handle curettes, and packed with $\frac{1}{2}$ inch iodoform gauze. The cavity is irrigated through this opening until the discharge practically ceases. So far, the results in a series of cases after this procedure have been better than those of the other methods.

46 W. 38th St.

Complications from the Use of Hydrogen Peroxide in Otology—M.

PAUL BRUDER—*Rev. Hebd. de Laryngol. d'Otol. et de Rhinol.*,
Sept. 3, 1904.

On account of its hemostatic and antiseptic properties, hydrogen peroxide is of considerable value in otology. It is, however, capable of causing untoward effects, sometimes on account of the impure quality of the preparation, and sometimes even where the article is of the best.

Commercially, there are three kinds of oxygen peroxide: Medicinal, surgical and the ordinary hydrogen peroxide of commerce. The two first are either neutral or very slightly acid, and these alone should be used in otology. The commercial article on the other hand contains a considerable quantity of hydrochloric and sulphuric acid introduced to retain its stability. This preparation may easily give rise to a distinct external otitis when introduced into the ear, and the reaction from this may be quite severe.

With hydrogen peroxide of good quality, complications have arisen when introduced into the ear and retained too long, causing maceration of the epidermis.

In cases of otorrhea with cholesteatoma, severe reaction has been caused by the action of hydrogen peroxide, the cholesteatomatous mass becoming distended and causing severe pain, fever and even cerebral symptoms.

In operations on the mastoid, when there exists a phlebitis of the sinus with sphacelus of the internal wall and extra-dural abscess, fatal complications have occurred due to septic particles being carried to the dura-mater by the hydrogen peroxide.

SCHEPPEGRELL.

CHRONIC EMPYEMA OF THE ANTRUM OF HIGHMORE.*

BY G. A. LELAND, A.M., M.D., BOSTON.

This disease presents itself in such various aspects as to symptomatology, etiology, and treatment, and recent literature on it is so vast and comprehensive, that one might be pardoned a feeling of diffidence when asked to condense into ten minutes his conclusions on this subject. But the very fact that there are so many writers and opinions shows that it is a difficult one, and that it will probably be some time yet before the last word is said.

Now, it is doubtless true that the two extremes of cases, the very severe and the very mild, leave no room for doubt as to their proper handling. First, there are the very severe uncombined cases which demand radical treatment at once. In this class are those where intra-antral pressure of polypoid degenerated mucosa, of quasi cholesteatomatous masses, of bony cysts, or of neoplasms cause intense suffering from pain, neuralgic or hemicranic, or from reflex neuroses, such as asthma; also where there is danger of bony distension so as to produce deformity, or absorption of the outer walls so as to infect the soft parts; and where there is extensive necrosis. These demand the radical Caldwell-Luc operation. But they are few, even when are included those intractable ones set up by the presence of a foreign body, such as a lost drainage tube, or a piece of exfoliated bone—probably less than one tenth of the cases.

Second, on the other hand, are those very mild cases of slight discharge of muco-pus or even of pus, intermittent, with only occasional odor, with no pain and almost no discomfort, where the principal complaint is of a rather frequent use of the handkerchief which is perhaps markedly soiled, or where the discharge is especially prolonged after a cold. Such patients often prefer to sustain their slight catarrhal discharge even over a period of years rather than to focus their discomforts into intense suffering for a week or more, since we cannot promise them with truth that they will then be wholly free. For it seems to be the opinion of the best authorities, and I am sure my own experience bears it out, that, after the radical operation, patients are by no means restored to a normally comfortable condition. To briefly cite one case, that of a lady about thirty years of age, who suffered intensely for nine months before

* Read before the Twenty-seventh Annual Congress of the American Laryngological Association, held at Atlantic City, June 1 to 3, 1905.

the operation, with pain, headache, vertigo, insomnia, foul discharge, etc., where a dentist had perforated the alveolar process above and anterior to the first molar, a perfectly sound tooth. He syringed it out frequently through a rubber drainage tube. The perforation gradually closed so that the tube could not be reinserted after a time, and he then passed in a roll of rubber dam and did not anchor it. One morning after breakfast, this was lost. After this, syringing was continued through the aperture till it became so narrow that it was impossible to introduce the probe-pointed syringe. Suffering at this time began to be more intense, but operation was delayed because of a soon expected confinement, and her family physician did not dare risk it. It was notable that transillumination showed that side as clear and bright as the other and the pupil as well illuminated, convincing us that the antrum was full of polypi, the layers of pus being too thin to cast a shadow. At the operation, the canine fossa was entered, the anterior wall resected up to the infra-orbital foramen, an enormous mass of polypi curetted out together with the rubber dam, the anterior end of the lower turbinate removed, and a large opening made into the nose. A strip of iodoform gauze, one-half inch wide and three feet long, was packed rather firmly into the cavity and the end left presenting at the introitus nasi; the periosteum, etc. was brought down over the anterior opening, and the alveolar wound sutured. The patient, a very nervous neurotic lady, suffered intensely for several days even after the gradual removal of the gauze. Irrigation and insufflation of powders into the antrum through the nose was carried out till the antrum ceased to discharge, and its interior is now apparently in a satisfactory state. But the vertigo continues, "sinking spells" as she calls them. Headache was very intense, so severe that the second turbinate had to be mostly removed because it pressed on the septum and outer wall; but she still suffers, and there is an annoying formation of crusts which require constant care, evidently due to cicatricial tissue over the stumps of the turbinates, especially the lower. There is no evidence of other sinus disease to be found, though carefully searched for. An untoward result in this case is that a large area of the cheek just external to the nose, and of the lip below it is still anaesthetic so that discharges from the nose run down to the mouth unawares, a distressing source of complaint to a sensitive lady. When the distribution of the terminal twigs and filaments of the infra-orbital branch is considered, both inside and outside of the antrum, I do not see why this result of the operation is not more often mentioned.

Were it not that there was a foreign body here present, I should feel very uncomfortable to have left her in such a state.

Another case of far less severity, but where radical treatment was called for, still is annoyed by this crust formation on the stumps of the turbinates, though the antrum is dry and a probe introduced through the opening in the outer nasal wall shows it to be nearly filled with fibrous tissue covered by a mucous membrane apparently healthy.

But third, nine tenths of the cases constitute the great middle class to which attention is especially called, and here it may be profitable to spend a few moments on the etiology of these affections. Most writers who express any opinion attribute about one half the cases to dental and the other half to nasal origin, the latter being the result of invasion in the course of the infectious diseases, especially of influenza, and probably the great increase of these affections dates from our first marked epidemic of influenza in 1889.

However, those attributed to dental origin are usually described as coming from carious teeth, abscess at the roots, exfoliation of the roof of the tooth-sockets, etc. But in my experience another etiological factor has been apparent, viz: a periostitis of the alveolar process caused by the improper striking of the cusps of the teeth, increased by conscious or unconscious grinding, one tooth in either jaw having moved but slightly, its neighbor which kept it in proper apposition having perhaps, been lost. The same effect may be produced by a pulp-stone in an upper tooth. These cases require no interference from the rhinologist, the condition rapidly subsiding after the dentist has corrected the abnormal condition.

Another etiological factor is a perversion of the respiratory function of the nose. Mr. Mayo Collier, of London, in a little brochure a few years ago, showed how the alternate condensation and rarefaction of the air in the nose caused a pumping action which seems to explain how these accessory cavities (including the middle ear) ventilating into the nose, are able to keep their orifices free and their interiors clean. The *introitus nasi* is a much smaller orifice than the choana and of course much smaller than the lumen of the naris. The effort of inspiration draws much more air backwards and downwards than can readily pass through the anterior orifices, causing a partial vacuum in the nasal chambers, the air from the sinuses rushing out to correct this negative pressure. Per contra, the current passes back into the sinuses during the act of expiration when more air is forced into the nose than can in the same

time rush through the narrow introitus. That this is true of the middle ear was shown some years ago by a German observer who by applying an iridescent paint to the drum-head saw corresponding movements in a case where the Eustachian tube was normal.

Trusting to the aid of this respiratory function, and not forgetting that the natural exit of the antrum is in certain positions of the body at the bottom, and also that the normal cavity is lined by ciliated epithelia; and trusting also to the regenerative power of the intra-antral mucous membrane after that which keeps up its morbid action has been given an outlet by freeing and at times increasing the size of the natural opening; and moreover avoiding as a vicious proceeding, far reaching in its results, the sacrifice of the inferior turbinates, the writer has conducted many of these cases of chronic empyema of the maxillary sinus in the last few years to a successful termination, without the suffering and mutilation of the radical operation, assisted sometimes by irrigation but often without. To this end, irregular septa nasi may have to be corrected, hypertrophic mucous membrane in or around the second meatus may have to be reduced, an enlarged uncinat process or obstructing ethmoidal bulla may have to be removed, the second turbinate may have to be displaced inward, or a large artificial opening may have to be made through the second meatus where the bone is thin and easily punctured or cut away, or where a bony dehiscence may make it only necessary to remove the double membrane. For making this opening he has had constructed a sharp, strong hook-like instrument of toughest steel, the blade a little longer and wider than Hajek's with a sharp cutting edge on the inside (7 mm. long and 2 mm. wide) which fits into the same handle. This can be easily thrust through the outer wall, just above the lower turbinate where there is space enough to avoid the orbit, and at about the middle of the second turbinate's lower edge; a cut is then made forward about one-half inch. If the bone resists, the point may be turned upward and inward at either or both ends of this cut and made to break its way through the bone into the nose, and then with Luc's small forceps the opening may be sufficiently enlarged. (This permanent opening through the second meatus and the preservation of the lower turbinate in which lies most of the respiratory function of the nose, has been advocated lately with much force and reason by Gerber of Königsberg, (Fränkel's Archivs Vol. XVII, first part), though he does it after clearing out the cavity through the canine fossa, thus modifying the Caldwell-Luc operation.) The opening thus made is then kept open by

washing through an irrigation tube (Hartmann's or, better, a large Eustachian catheter properly bent) once or twice a week, keeping clear of granulations by forceps or caustics; and the patient is instructed frequently to cant the head in the proper direction to bring the orifice as near underneath as possible, and then to blow forcibly through the nostril to syphon the contents out of the cavity.

By means of the enlarged hiatus thus made and thus treated, a case has lately been discharged *well*, which was of fifteen years' standing, accompanied by all the symptoms of almost constant headache, foul discharge, ill health, melancholic mentality, aprosexia, etc., for which several surgeons and specialists had advocated and urged the radical operation as a *sine qua non*, and that only two or three months after this large opening had been made, though a considerable time had been spent previously in getting the second turbinate into a normal condition. The state of this lady is infinitely better than those above mentioned, who suffered the radical operation and are still suffering from it.

The displacement of the second turbinate has been mentioned. This I have found to be a useful procedure when it hugs the outer wall too closely and especially if it rests on an enlarged uncinat process. It is not always necessary to remove this bone especially if it is reasonably healthy, or can be made so; but, by the use of an elevator or far better by the use of Killian's long nasal speculum, this may be pressed inward till its attachment cracks and then kept in its new position by a small packing in the second meatus for a few days, when it will remain there permanently, thus giving a second meatus sufficiently wide for drainage in not a few cases.

By these comparatively simple conservative measures, following out nature's laws and methods, the writer is convinced that this large middle class of cases may be still further enlarged to include many of those now considered to demand radical surgical interference. And at any rate, such methods should be given a thorough trial before the severe ones are resorted to. For though "there is a divinity that shapes our ends, rough hew them how we may," we do not believe that that divinity shaped our upper end to be unnecessarily rough hewn by every ambitious rhinologist, young or old, with a surgical bent, who may have observed in our large municipal or perhaps European clinics a bold, fascinating, almost reckless dexterity applied to the worst cases that can be found among the lowest classes of society where the finer sensibilities are in abeyance, or where the victims, through fear of, or in gratitude to,

their surgeon, do not magnify their post-operative discomforts, disregarding their lesser ills, because relieved of the greater; but this is rarely the case in private practice and, for this reason, these conclusions have been drawn from the behavior of those in the higher walks of life.

Permanent or temporary openings into the mouth except because a diseased tooth socket affords a convenient route, should be condemned for the very valid objection, that they give access to the antrum through the most infectious cavity that we know of; and for another objection, that pus-flavored food is not appetizing. And yet this is the method of the dentist; though, as far as I can learn, the best of them never sacrifice nor jeopardize a sound tooth for this purpose.

And finally it must not be forgotten that many of these patients are in very poor health and should have the advantage of vigorous building up treatment.

669 Boylston St.

Suppuration of the Ethmoidal and Sphenoidal Cells—R. C.

DUGAN—*St. Paul Med. Journ.*, Oct., 1904.

Suppuration in the orbit in connection with infection of the ethmoidal and sphenoidal cells is no uncommon occurrence but frequently exhibits no previous symptoms of trouble in the nose. In one case, a child, three years old, was taken suddenly ill in the night with convulsions, only one side of the body being involved in the convulsions. These continued for twelve hours. Mastoid disease with brain involvement was suspected but nothing could be determined by examination of the ears. After forty-eight hours, the left eye suddenly bulged forward, and an incision in the upper inner part of the orbit disclosed pus. The infection had its origin in the anterior ethmoid cells. In another case, the first symptoms were those of eye-ache followed by bulging. In this case there was no previous nasal symptoms. An incision over the eye gives better drainage, shows less of a scar and lessens the danger of a dacrocystitis complication.

STEIN.

THE FRONTAL SINUS.*

BY C. G. COAKLEY, M.D., NEW YORK.

In the short time allowed for the presentation of this subject, one must necessarily be brief in discussing many points which deserve fuller consideration. I shall confine myself strictly to answering the questions propounded:

A. What symptoms in diseases of the nasal sinuses demand radical surgical intervention?

B. What have been the comparative results of conservative and radical methods of treatment?

The answers will be based upon my personal experience in treating diseases of the frontal sinus.

ACUTE FRONTAL SINUSITIS.

A. The following symptoms demand external opening of the frontal sinus:

First. Edema and redness of the upper eyelid, accompanied by throbbing pain over the sinus, provided they show a tendency to increase in severity for more than 24 hours after the resection of the anterior third of the middle turbinate and the thorough contraction of the mucous membrane in the middle meatus by means of local applications of adrenalin and cocaine.

Second. Marked prolapse of the orbital wall of the frontal sinus.

Third. Displacement of the globe of the eye downwards and outwards accompanied by diplopia.

Fourth. The development of a fistula at the upper angle of the orbit as evidenced by redness, great swelling, and fluctuation in this region.

Fifth. Intense supra-orbital and frontal pain which cannot be relieved by establishing adequate drainage through the naso-frontal duct with a tendency to an elevation in temperature and symptoms of beginning meningeal inflammation.

B. Comparative results:

Fortunately the above named symptoms, demanding external operation in acute frontal sinusitis, are not very frequently encountered. In a series of 58 cases of acute frontal sinusitis occur-

* Read before the Twenty-seventh Annual Congress of the American Laryngological Association, held at Atlantic City, June 1 to 3, 1905.

ring in my private practice, between Jan. 1st, 1903 and Jan. 1st, 1905, 54 made complete recoveries as a result of intra-nasal treatment, such as the excision by forceps and snare of as much of the middle turbinate as lay anterior to the opening of the naso-frontal duct in the middle meatus of the nose, in conjunction with the use of douches of hot normal saline, and the local contracting effects of adrenalin and cocaine applications. One patient seen for the first time, forty hours after the onset of the attack, in which the left ethmoid and sphenoid were involved, died 23 hours later from an acute meningitis with symptoms of great intra-cranial pressure as evidenced by a pulse of forty. The anterior third of the middle turbinate was excised, and judging from the discharge, drainage was good. I believe the infection of the meninges occurred prior to the time I saw the patient, but whether through the bloodvessels of the nose, or through the frontal, ethmoid or sphenoid sinus, I cannot state. No autopsy was obtained.

Of the three cases operated on externally for the relief of symptoms, one was found not to have any frontal sinus on the affected side, merely a markedly congested diploe which bled profusely during the operation. The patient recovered. The second case operated upon was found to have an enormously large frontal sinus which extended from the external angular process of the orbit on the left side, to the middle of the supra-orbital arch on the right. The radical operation was performed and the patient recovered. The third case operated upon, was in a patient who had syphilis. The antrum had been opened a week before through the canine fossa; the floor of the orbit was found entirely necrosed and was removed. As symptoms of meningitis and sepsis developed with marked displacement of the eyeball downwards and outwards and exophthalmos, a radical operation was performed on the frontal sinus and ethmoids. The floor of the frontal was necrosed and the cavity filled with pus. The ethmoids were also badly necrosed. The patient died 48 hours later from meningitis and sepsis.

CHRONIC FRONTAL SINUSITIS.

Chronic suppurative frontal sinusitis as a distinct entity, unassociated with suppuration in some of the neighboring sinuses is a condition I have never met with. There has always been an ethmoiditis present and the antrum in a large percentage of cases was either diseased or the receptacle for pus flowing down from the frontal and ethmoid sinuses.

A. The following symptoms demand radical operation:

First. Chronic suppurative frontal sinusitis accompanied by multiple polyp formation in the nose. These cases are always associated with an ethmoditis. The removal of the polypi, curettage of the ethmoids, dilatation of the naso-frontal duct and the irrigation of the frontal sinus ameliorate the symptoms for a few months. In a large percentage of cases, the polypi and symptoms recur and the process of relief is again undertaken. In elderly people or those with marked organic lesions of the heart, lungs or kidneys, a radical operation may be unadvisable. To all other patients a radical operation is proposed if they desire to be permanently rid of their disease.

Second. A radical operation is indicated in severe acute exacerbations of the chronic condition whenever any of the symptoms enumerated under acute frontal sinusitis develop.

Third. If intra-nasal treatment of a frontal sinusitis does not suffice to prevent the discharge from passing into the antrum and the odor and taste of the fetid discharge from the latter annoy the patient, then in order to cure the antrum, the frontal must be operated upon radically.

Fourth. Very large frontal sinuses with multiple septa and particularly those with recesses extending backwards over the roof of the orbit can be but imperfectly irrigated. Until recently we have had no means of ascertaining these facts. Skiagraphy, however, as now practised will give us the exact height and breadth of the frontal sinus, indicate the number and position of the septa and in many cases inform us of the presence of an orbital recess. The radical operation should be advised for such patients.

Fifth. Patients with narrow nasal cavities offer greater difficulty in carrying out intra-nasal treatment than those with more patent nares. When the drainage is poor and headaches frequent, these patients gladly submit to a radical operation.

Sixth. There is a large class of patients living at some distance from the larger cities who journey thither to get relief from their suppuration. Considerable sacrifice is entailed in their absenting themselves from home and business. They desire to be cured and that as quickly as possible. Intra-nasal treatment is slow and the results uncertain. A radical operation may take as long to affect a cure but when obtained is permanent.

Seventh. The neurasthenic patient who is prostrated each time intra-nasal treatment is attempted, and rarely submits to enough

being done at any one time to make much progress, is more satisfactorily treated by the radical method. There is seldom any pain after the second dressing by the latter method.

Eighth. If a fistula has formed leading into a frontal sinus, a radical operation is the only treatment likely to affect a cure.

B. Comparative results:

Conservative treatment. I regret that my statistics on the intra-nasal method of treating chronic frontal sinusitis are not more exact. We find a record of 79 such cases. We feel quite confident that 11 or 14% of them may be considered cured as they have been seen at least two years after having been discharged as cured and although afflicted with the usual slight head colds one or more times have had no hypersecretion from the nose after the cold disappeared. Of the remaining 68 cases, 27 or 35% have been lost sight of and whether cured or not is uncertain. Of the remaining 41, 24 or 30% have returned with recurrences one or more times a year. Twenty-two of these cases have polypi. The remaining 17 cases, after having been under treatment for a period varying from six weeks to three years, finally consented to a radical operation and all have been cured. To recapitulate—14% were cured by conservative treatment, 51% were improved but not cured, and in 35%, the result is unknown.

Radical Treatment. Several types of radical operation have been used for curing chronic suppurative frontal sinusitis:

First. The Ogston-Luc operation. Briefly, it consisted in opening the anterior wall of the sinus, imperfectly curetting the mucous membrane, dilating the naso-frontal duct, usually inserting a rubber drainage tube through the latter into the nose for a few days, sewing up the frontal wound and trusting that the better nasal drainage would eventually result in establishing a cure. My experience with this operation was decidedly unsatisfactory. We performed it about 25 times and fully half the cases had a return of their secretion and headache after contracting a severe rhinitis a few weeks or months later. The cosmetic effects were elegant, merely a linear scar. To my mind little more can be accomplished by this operation than by thorough intra-nasal treatment.

Second. The Kuhnt Operation. Kuhnt removed the entire anterior wall of the frontal sinus, eviscerated the entire mucous membrane in the cavity, naso-frontal duct, and adjacent ethmoidal cells, sewed up the skin wound and placed drainage from the bottom

of the wound into the nose. This operation appealed to me as being a better one than the Ogston-Luc, but I felt that the nasal drainage was inadvisable. One could not tell how much of a cavity was still left to be infected through the nose.

Third. The Open Operation. My experience with the mastoid led me to believe that it might be possible to treat a frontal sinus like a mastoid, i. e. to operate in the manner of Kuhnt but to pack the frontal sinus and naso-frontal duct so that granulations would spring up and first occlude the narrowest part of the cavity, the bottom of the naso-frontal duct. This having been accomplished the condition would be the same as in a mastoid wound after the closure by granulations of the aditus and antrum, and it would be merely a matter of time for the upper part of the frontal sinus to fill with granulations and become completely obliterated. There is, of course, some deformity depending upon the size of the cavity. If the operation is properly done, there is no greater danger of recurrence than in a mastoid.

From the spring of 1901 until Jan. 1, 1905, we have operated on 104 patients by the open method. In nine of them both frontals were involved, making 113 frontal sinuses treated. One patient still has, 2½ years after the operation, a small fistula practically not discharging. Two patients had fistula, one nine months after the operation and the other fourteen months. Both were operated on a second time, and it was found that some of the mucous membrane had been left at the first operation; both are cured. Two of the 104 patients are dead; one died from chloroform anesthesia, for an operation on the maxillary sinus, seven weeks after the operation on both frontals which had healed; one died of pneumonia, five months and six days after operation, the frontal sinus having healed. There have been no relapses.

Thus of the 104 cases, two are dead, one has fistula, and 101 are living cured of the frontal sinusitis. Seven are under occasional treatment. Three of the seven have sinuses in their antra, six of the seven have occasional discharge from the sphenoid.

Fourth. The Killian Operation. This is preferred by the Continental rhinologists—It is an operation requiring time, but supposedly it removes all the ethmoidal cells in addition to obliterating the frontal sinus. I have never operated by this method as the results obtained by the open method have been very satisfactory.

THE CONSERVATIVE TREATMENT OF CHRONIC SUPPURATION OF THE FRONTAL SINUS.*

BY W. E. CASSELBERRY, M.D., CHICAGO.

In conforming to the suggestion to discuss the treatment of chronic suppuration of the frontal sinus from a conservative standpoint, it is not my intention to espouse conservatism to the exclusion of radical methods which are at times imperatively indicated. Nor do I understand as "conservative" a policy of mere expectancy or inert medication, but rather a reference to the intra-nasal minor operative methods including partial middle turbinectomy, enlargement of the naso-frontal duct and curettage of adjoining ethmoidal cells, which have for their purpose effective drainage, hence, substantial betterment and, occasionally recovery. These methods hold an important place in practice; but since the introduction of the new external operations of Killian and of Coakley which commend themselves as scientific and more satisfactory, affording a reasonable expectation of cure without the extreme of deformity, and moreover with our present realization of the frequent large formations of pyogenic granulation tissue within the sinus, there is reason to consider whether it is wise longer to recommend or to countenance conservatism with a view to the avoidance of a radical operation, and if it is, then when and why, and conversely what are the conditions which demand an uncompromising attitude to radical intervention.

The surgery of the frontal sinus involves cosmetic considerations which do not pertain to the other nasal sinuses. Most patients, influenced by repugnance to facial disfigurement, have, in my experience, rejected the idea of an external operation except as a last resort; hence one must often sanction less radical means or accomplish nothing. The patient, perhaps conceding the possibility even of brain infection, will still hesitate, content to weigh his chances pro and con. The actual liability to brain complications from frontal sinusitis must be far less than from suppurative otitis, and it appears from Onodi (¹) that they are relatively fewer than from sphenoidal sinus suppuration. Not many cases of complicating

* Read before the Twenty-seventh Annual Congress of the American Laryngological Association, held at Atlantic City, June 1 to 3, 1905.

¹ Onodi: *Journ. Laryngol.*, London, 1894, p. 617.

brain infection are recorded. Logan Turner ⁽²⁾ and Killian ⁽³⁾ collate forty-two. Wertheim ⁽⁴⁾ cites only three records from ten thousand autopsies. My search through the last decade of the *Journal of Laryngology* disclosed but one, aside from several cases of fatal osteomyelitis due to the external operation itself.

This post-operative mortality is another disquieting feature of radical methods. As indicated by Logan Turner, who collates twenty-four strikingly similar operative fatalities, infection of the diploe of the frontal bone occurred contemporaneously with the operation, probably through the necessary removal of the granulation tissue and not particularly by the too forcible removal of it.

The demand for radical surgical interference is imperative when there are actually present symptoms of commencing intracranial infection such as severe persistent headache, chills, fever, central paralysis, etc., but the mere indefinite chance of complications of this kind does not warrant an external operation without additional valid reasons in as much as one risk may be said to balance the other. Hence the intranasal or conservative methods are especially suitable for latent and mildly chronic uncomplicated single sinus suppurations.

It is alleged, although not proven, that sinus suppuration is contagious, that the uncured patient is a menace to his intimates. Certainly the recurrent attacks of tonsillitis and erysipelas to which sinus patients in my observation, are prone, are communicable to others. The frequency of multiple sinusitis and the fact that with the frontal sinus one or more ethmoidal cells are often affected are indications of a liability to the spreading of the infection from one sinus to another in the same patient. But scarcely do these considerations demand radical interference without additional reasons, although they will justify it, as soon as any external method is demonstrated to be successful with reasonable certainty, at the expense of but slight deformity and without special hazard. Whether or not this desired culmination is already at hand, it is hoped may appear from the present discussion. Meanwhile drainage by intranasal methods certainly tends to prevent an extension of the infection.

Additional valid reasons for the external operation are: persistent failure of the general health or impaired vitality from septic absorption, serious mental depression, distension of the sinus, abscess of or encroachment upon the orbit, external fistula, impermeability of the naso-frontal duct, syphilitic necrosis, inveterate multiple

2 Turner: *Journ. Am. Med. Assoc.*, 1905, p. 347.

3 Killian: *Heymann's Handbuch*, Bd. iii, S. 1131.

4 Wertheim: *Arch. f. Laryngologic*, 1901.

sinusitis, and economic conditions or occupations which preclude the more tedious efforts. But even so, in as much as a middle turbinectomy preliminary to a radical operation is usually desirable, this or other methods of the conservative class may be or perhaps even should be first invoked provided the symptoms be not urgent and further provided the patient's available time be not thus wholly exhausted.

To illustrate the foregoing conclusions, I have traced the subsequent history of a few cases, which serve also the purpose of describing briefly the conservative treatment and the degree of success and the lack of success attained.

Cases I to V, were all similar to J. B. M. who exemplified the mildest type, a latent chronic frontal sinusitis (for which conservative methods seem suitable.) There was no continuous discharge but severe subacute attacks were repeated every 8 or 9 months, until the middle turbinated bodies were reduced by deep cauterization, when the attack ceased for a period of eleven years with but one trifling recurrence since.

Case VI, also of mild type, Gen. L., had only an intermittently conspicuous discharge. Irrigation of the left frontal sinus after middle turbinectomy evacuated pus. Three years later he reports that the discharge gradually lessened and finally stopped.

Cases VII to IX were similar, all multiple sinusitis, and in all I advised but did not insist upon a radical operation. All suffered moderately from headache and impaired health which were helped by drainage, established by means of middle turbinectomies curettage and irrigation. One of them, Miss B., rejected an external operation in fear of deformity. She had also pulmonary tuberculosis so, after several months of nasal treatment, she moved to California. Eight years later her father, a physician, writes that she is in good health, the sinus suppuration having apparently ceased several years ago. Another, Mr. G., rejected an external operation because he could not risk losing a salaried position by "laying up." Three years later he writes,—"After your operation in the nose, the constant use of the cleansing lotion keeps down the acute symptoms. I do not suffer to the same degree." The third, Mr. J. A. M., aged 65, suffered also from albuminuria, hence he rejected an external operation in fear of the prolonged anesthesia. I cautiously enlarged the naso-frontal duct with Ingal's instrument, under cocaine anesthesia, in three sittings. Some months later his family physician wrote that he was well by comparison with his former state, and one year later the patient writes that this improvement is maintained.

Cases X to XII were much like the last group except that being poorly circumstanced, treatment was too early interrupted and while benefit accrued it was far from a cure. Middle turbinectomies were made to substantiate the diagnosis and as a preliminary step to radical operation, but the latter never was reached. One of them, Miss W., with bilateral frontal and ethmoidal suppuration had had forty-four attacks of facial erysipelas and still has them, notwithstanding distinct betterment in discharge and odor. In another, Mrs. H., the headache disappeared but the secretion continued, while Mr. K. acknowledges but little change. Entrance to the hospital and the most expeditious radical means are economic necessities with this class, for otherwise little is accomplished.

In cases XIII and XIV, the naso-frontal duct was impervious even after middle turbinectomy. Mr. Mc. C. had suffered spontaneous rupture with remaining fistula and Mr. I. M. had frontal prominence and tenderness. They were not benefited by intranasal treatment but rejected the external operation, which I should now more confidently insist upon under like conditions.

In cases XV and XVI, syphilis was the underlying cause yet anti-syphilitic treatment had little influence. From clinical reports it would seem that syphilitic cases are especially prone to brain complications through necrosis of bone, hence in them radical treatment should not be too long deferred.

Summarizing the results of the conservative treatment in these sixteen cases, six were of a mild type and these are now well. Of the remaining ten typically severe cases, only one can be called cured, two are much improved, suffering but little inconvenience, three more are somewhat improved but are still sufferers, and the remaining four are unbenefited.

Venetian Bldg., 34 Washington St.

THE ETHMOIDAL SINUS.*

BY JOHN O. ROE, M.D., ROCHESTER, N. Y.

While the Frontal, Maxillary and Sphenoidal Sinuses vary greatly as to size, shape and general contour, they bear a very constant relation to one another, and are remarkably uniform when compared with the almost infinite variations of the air spaces occupying the Ethmoid region, very properly called the Ethmoid Labyrinth.

In the case of the other sinuses, we rarely or never find but two cavities, although in exceptional instances, there may be an absence of one or both, whereas in the case of the Ethmoid Sinuses, the same number of cells is never found in any two cases, nor in the two sides in the same case, nor are they alike in size, shape or general conformation.

Also, in diseases of the other Sinuses, the same pathological conditions give rise to symptoms more or less constant, varying little in different cases; and the same methods of diagnosis are of service in detecting each particular disease; and the same methods of treatment in different cases are quite uniformly successful. On the other hand, in the case of the Ethmoid Cells, the extreme variation in their number and location, many of them hidden, being deeply from reach, and the inaccessibility of their ostia for exploration, render the disease of these cavities often most obscure and most difficult to treat; and the symptoms being correspondingly varied oftentimes give no indication of the exact location or the nature of the diseased process.

The Ethmoid Cells constitute the middle section of this chain of air spaces, extending around the outer border of the roof of the nasal chambers from one Frontal Sinus to the other, and form the connecting links, on each side, between these different cavities.

By the way of classification and for convenience for study, they have been sub-divided by some anatomists into anterior, middle and posterior cells; while others from a clinical basis, have divided them into the anterior and posterior groups, according as they communicate with the different regions of the nose. Thus, those located in front and communicating with the middle meatus of the nose, below the base of the middle turbinated bone, are termed the Anterior

* Read before the Twenty-seventh Annual Congress of the American Laryngological Association, held at Atlantic City, June 1 to 3, 1905.

Ethmoidal Cells; while those located behind and communicating with the superior meatus above the base of the middle turbinate, are termed the Posterior Ethmoidal Cells. The Anterior group of cells are closely associated with the Ostium Frontale and the floor of the Frontal Sinus, forming a distinct prominence upon its floor, termed the Bulla Frontales, while just posterior to this region we find, in relation to the nasal aspect, a rounded bony prominence, the Bulla Ethmoidalis, containing an important cavity, often or usually communicating with the surrounding air spaces or cells.

The Posterior Ethmoid Cells are related to the Sphenoidal Sinus and Maxillary Antrum, although not in direct communication with them. The Ostia of these different Ethmoid Cells are by no means constant. The larger cells usually communicate with the nasal passages by separate Ostia, some of them, however, having two or more openings. These openings are generally on the superior portion of the cavity and so deep-seated in the superior meatus as to be invisible on a rhinoscopic examination and usually inaccessible for exploration.

The bony laminae which intervene between the various Ethmoid border cells and the Frontal, Maxillary and Sphenoidal Sinuses are usually so extremely thin that, in case of chronic suppuration within these cells, caries of the laminae is quite liable to occur, followed by perforation and subsequent infection of the neighboring cavities. This, Turner states, may afford an anatomical explanation of the frequent occurrence of suppuration in two or more of the Accessory Sinuses, associated with a similar affection of the Ethmoid Cells.*

In considering the symptoms that indicate the necessity for radical surgical intervention, we may classify them under one of two heads, viz: pus or pain; that is, those associated with the formation of pus or those in which the presence of pain is manifest.

Radical measures, may be regarded as rather an ambiguous term at the present time, for what one regards as radical another surgeon considers quite conservative. But in a general way, however, we may regard all operative measures radical, varying of course in degree, and all forms of medication, both local and constitutional, conservative treatment.

Acute inflammatory conditions rarely demand surgical intervention, except where they are engrafted upon a chronic condition, as in the case of a fresh infection superimposed on a chronic catarrhal process or a chronic empyema. In other cases, where an acute condition becomes chronic and purulent, resisting all local measures of a detergent or antiseptic nature, radical measures are demanded.

* "The Accessory Sinuses of the Nose." Edinburgh, 1902, p. 32.

A woman, aged 40, who had had, for several years, a chronic catarrhal condition about the upper portion of the nasal fossae, with much discomfort about the nose, contracted an influenza causing a severe inflammation of the turbinated tissues, attended by a profuse discharge, which soon became purulent. She had also severe pain in the side of the face and distress about the bridge of the nose and frontal headache. By contracting the tissues with Adrenalin and with the aid of the probe, the discharge was traced to the Ethmoid Cells, the Bulla Ethmoidalis being markedly distended. This cell on being opened was found unusually large and filled with a muco-purulent material containing some streptococci. The surrounding Ethmoid Cells in communication with this cavity were also involved; these were freely opened and drained, when the nasal disturbance subsided.

Many so-called ozaenas and purulent conditions of the accessory sinuses result from the early neglect of catarrhal conditions of the Ethmoid Cells that might be prevented by timely radical measures of a comparatively conservative nature.

A young woman, of 25 years, recently came under treatment for ozaena, which she had had since her twelfth year and which followed a severe influenza contracted by holding her head under a cold water faucet to cool off on a hot day, in imitation of her older brothers. Soon after, she began to have a profuse discharge from her nose, which in a short time became foetid and continued so until I saw her, notwithstanding the constant use of sprays, washes, etc. The ozaena odor at this time was marked and the crusts were large and blown out frequently. The tissues of the whole interior of the nose were characteristically atrophied, but the mucous membrane was smooth and unbroken. In a short time after cleaning the nose, these crusts would reappear in the usual mysterious manner on the unbroken membrane. On wiping the membrane dry with cotton and watching for the reappearance of the discharge, a small amount was seen to stealthily creep out from the Ethmoid region in the vicinity of the Bullae, and could be seen to reappear after being wiped away. This I traced with a bent, blunt-pointed slender probe to its origin in the Ethmoid Cells.

After cocaineization, I opened the whole chain of diseased cells with a Grünwald cutting forceps. A deep furrow was made through the bottom of these cells, and so far as could be detected with a probe, all the diseased and necrosed cells were excavated. It was interesting to note the immediate disappearance of the foetor, and the rapid drying up of the discharge as the parts healed.

This case is but a type of such cases, and the more of them I see, the more I am convinced that co-called ozaena is nothing but a foetid discharge from some of the Accessory Sinuses, usually the Ethmoidal.

Disease of the Frontal, Maxillary and even the Sphenoidal Sinuses is usually detected and properly treated; but when hidden in the Ethmoid Cells it frequently goes undetected, causing a slow necrosis of the cells and the consequent odor, and also the atrophy of the surrounding soft parts arising from the associated disturbance of nutrition.

The foul discharges and crusts which so mysteriously appear on a smooth unbroken mucous membrane, the cause of which it has been claimed "no fellow could find out" have been attributed to perversion of the secretions of the mucous glands in some unaccountable manner, to special discrasias and to various other causes. These will be found in nearly all cases, I believe, to have their origin in some of the Ethmoid Cells, although perhaps too deeply hidden to be readily detected; and it is only by radical methods of treatment that the cause of this trouble can be reached and cured. This is illustrated by many cases that I could cite did time and space permit.

Increasing familiarity with the cellular structures of the nose leads us to recognize the early stages of diseased conditions, which if dealt with in a radical manner, as is practiced in disease of the Mastoid Antrum and Cells, will not only prevent the establishment of a chronic disease of these cavities, but will often forestall conditions, as in the case of chronic aural diseases, that may lead to serious consequences. "A fatal case of necrosis of the Sphenoidal and Posterior Ethmoidal Cells," has recently been reported by Whitehead of London.

A woman, aged 47, in good health, had had for two years a purulent discharge from the left side of the nose, said to have followed an attack of facial erysipelas. For five weeks, there had been frequent and very severe headaches and attacks of vertigo; for three days, occasional attacks of vomiting, slight rigors, fever, a general sense of malaise and diplopia in the left eye.

On examination of the nose, thick creamy pus was seen descending between the septum and the middle turbinated bone on the left side. Under ether, the Posterior Ethmoid Cells and the anterior wall of the Sphenoid, on being found soft and carious, were removed and the cavities curretted. The general septic condition,

* *Journ. Laryngol.*, London, April, 1904, p. 179.

however, was not arrested and the patient died. Staphylococci were found in the nasal discharge and in a culture from the blood.

Post Mortem examination showed only the Posterior Ethmoid Cells, the Cavernous Sinus and the Sphenoidal cavity involved in the diseased process. No disease was present in the Anterior Ethmoid Cells, in the Antra, in the Frontal Sinuses or in the Orbits. The brain and meninges were healthy. The condition was clearly one of chronic suppuration in the Sphenoid Sinus and Posterior Ethmoid Cells, with an acute Staphylococcus infection occurring three or four days before she was first seen. The opening and draining of the sinus and the cells were powerless to arrest the spread of the pyemic infection.

The author very truly says "The importance of treating chronic nasal suppuration is still not fully realized by our profession at large. A persistent discharge from the nose is regarded with the same slight interest that a chronic Otorrhea attracted a few years ago; nevertheless, the present case illustrates the danger of leaving untreated a suppuration in close proximity to a vital organ."

Orbital abscess and cerebral symptoms sometimes complicate Ethmoidal abscess and urgently demand the most radical measures for their relief.

Many cases of persistent headaches, facial neuralgia, migraine and tic-douloureux caused by pressure within the Ethmoid Cells have come under observation, and the patients were cured by operative removal of this intra-cellular pressure. In some cases, this intra-cellular pressure may be caused by purulent or other accumulations confined by the occlusion of the ostia; in others, it may result from intra-cellular polypoid or other growths distending the cell; while in some others, it may be purely bony, from osseous thickening resulting from injury and a chronic non-purulent inflammation of the cells.

The following interesting case I will briefly cite in illustration of the latter condition:

A lawyer, aged 35, was sandbagged by a revengeful criminal whom he had prosecuted. The impact of the blow was over the base and bridge of the nose, and although the nose was not fractured sufficiently to cause marked depression, there was an impaction of the Ethmoid Cells and resultant osseous deposit that soon began to produce such intense headaches as to incapacitate him for work or even for social intercourse with friends or family. These headaches were also attended with most pronounced melancholia. This he had endured for over a year when I first saw him, four years ago.

On examination, there was found a condition of chronic inflammation and infiltration in the Middle and Posterior Ethmoid region, which could only be approached in the most cautious manner; and it was only after most careful work that the infiltrated structures were safely removed. As the pressure was removed the pain slowly subsided until at the end of about two years his local and general condition had so far improved as to enable him to resume his professional work.

Facial neuralgia is so frequently caused by intra-nasal pressure in the region of the middle turbinate that treatment of the pain should never be instituted without carefully investigating the Ethmoid region. This must often be done with the probe, sometimes requiring the use of cocaine, for by simple inspection only the condition of the parts and points of pressure cannot be specifically ascertained. In purulent cases, the appearance of pus is an aid in directing us to the diseased region; but as the pain in most neuralgic cases is associated with a condition of catarrhal thickening of the tissues, physical exploration for such condition is necessary.

I wish to mention one point in the etiology of sinus disease and especially in regard to the method by which infection is frequently forced into these cells. This is by the forcible blowing of the nose during a coryza, or while infected with an influenza, or whenever pus is lodged in the nose. By this means, and especially if the pressure is increased by closing one nostril, infection frequently is forced into normal cells that otherwise would remain healthy.

One or two points in regard to the radical measures resorted to in dealing with diseased Ethmoid Cells, and I am done. The use of the ring knife or sharp curette is not only illadvised, but, in many cases, positively dangerous, when used in proximity to the lamina papyracea or os planum or the cribriform plate. It is in cases of polypoid growths within the cells only, that the use of the curette is admissible; for, in the case of simple suppuration of the cells, perfect drainage is the desideratum, and not the destruction of the mucous membrane. The curette tears more readily than it cuts, and, therefore, the danger of laceration of the deeper structures is apparent.

In all ordinary cases of Ethmoid disease, the cells can be freely and safely opened by means of Grünwald's or Myles' punch forceps, with the assistance of the probe to determine the parts requiring removal, which fact has been clearly pointed out by Thompson.* In the

* "Diseases of the Nose, Throat and Ear." Edited by Wright, p. 971.

use of the forceps, by removing only what falls within their grasp and avoiding twisting or pulling away any portion, and working upward and outward, away from the cribriform plate, the operation of excavating the Ethmoid Cells is rendered comparatively free from danger; and it is in those cases only which are complicated with disease of the Frontal Sinus that the external operation is required.

The results of conservative and of radical measures of treatment in diseases of the Ethmoid Cells attended by the symptoms of pus or pain, therefor, are not to be compared. In the one, we have a long continued effort at cure by washes, sprays or other forms of medication, with an uncertain or doubtful recovery, and the constant danger, in the purulent cases, of the infection extending to the other sinuses, to the orbit or to the cerebral cavity. On the other hand, by radical measures, the abscess cavity is properly opened, thoroughly drained and medicated, the danger of infecting other sinuses or parts is avoided, and, in painful conditions if the intra nasal or intracellular pressure is removed, recovery is comparatively certain, speedy and permanent.

44 Clinton Avenue, South.

Electric Phototherapy in Otology—O. S. MEEROVITCH—*Rev. Hebd. de Laryngol. d'Otologie et de Rhinol.*, July 30, 1904.

By means of a special device, concentrated rays from an electric arc lamp are cooled in their passage to the ear so that only the effects of the light is obtained. The application lasts about a quarter of an hour. The author has observed good effects in catarrhal otitis and in chronic dry or sclerotic otitis.

In the first, the action of the light is soon noticeable in the relief of the pain at the first sitting, and even in cases that have resisted other methods. The absorption of the exudates appears also to be favorably influenced by the action of the light. In dry or sclerotic otitis the action is also favorable, especially in causing the disappearance or diminution of the subjective noises so annoying to the patient.

SCHEPPEGRELL.

THE ETHMOIDAL SINUS.*

BY JOHN W. FARLOW, M.D., BOSTON.

There has been so much activity in recent years in the study of the anatomy and disease of the accessory cavities that the thought naturally arises whether modes of treatment which have been found to be possible have as yet shown that their advantages are sufficiently great to counterbalance many risks and dangers which attend them. The ethmoidal cells are in proximity to the frontal, antral and sphenoidal sinuses and are near the orbit, the cribriform plate and the meninges of the brain. If ethmoidal disease is the cause of extension of suppuration to these important structures, the question of thorough methods for opening up, draining and removing these cells would seem to admit of only one solution.

Of symptoms which call for operative interference, one of the most common is headache, which is sometimes referred to the back of the occiput. This may be due to a complication with frontal disease, from inability of the latter to drain itself on account of enlargement of the ethmoidal bulla filling up the hiatus semilunaris. The headache may be caused by a pushing of the middle turbinate against the septum or by the development of one or more large cells in the turbinate, thus causing painful pressure against the septum. The presence of polypi, the result of ethmoidal disease, may serve to cause retention of secretion, pressure and headache. In my experience, such cases have not been uncommon, a small polyp, even granulation tissue or swollen mucous membrane sufficing as an obstacle.

The eye is often involved where there is ethmoidal suppuration, especially if there is marked retention of secretion. Swelling of the lids or conjunctiva, troubles of vision, displacements of the eye, abscess of the orbit, all these manifestations are to be laid at the door of severe ethmoidal disease and require thorough treatment. Meningeal inflammation, acute or chronic, has been noted in some instances.

Tertiary syphilis not infrequently attacks the ethmoid, showing itself by suppuration, crusts, necrosis and pain. The pus may find exit externally near the root of the nose and external operative procedures may be necessary in order to remove the large mass of necrosed bone.

* Read before the Twenty-seventh Annual Congress of the American Laryngological Association, held at Atlantic City, June 1 to 3, 1905.

The sense of smell may be much impaired or entirely destroyed in the nostril where the ethmoidal disease exists; but, unfortunately, the methods of treatment necessary for removing the diseased structures which cause the impairment of the olfactory sense cannot leave the nerve filaments in condition to resume their normal function. An attempt should, however, always be made to respect, as much as possible, the region where this important sense is situated.

Suppuration, causing a long continued flow of pus into the middle meatus, showing itself either anteriorly, or posteriorly in the post nasal space, with resulting pharyngitis, laryngitis, asthma, etc., and not amenable to ordinary treatment, may require surgical procedures for its abatement.

As a result of the irritating local action of the pus, the development of polypi in the middle meatus and a severe polypoid degeneration of nearly the entire middle turbinate may be so rebellious to all ordinary snare and curetting operations that removal of the ethmoidal cells and the turbinate may be necessary.

If the ethmoidal secretion is in such relation to the opening into the antrum that the latter acts as a reservoir for the pus, an opening into and removal of the ethmoidal cells may be advisable in order to cure the secondary antral symptoms.

We may summarize the symptoms of ethmoidal disease calling for surgical intervention: Severe or long continued headache, disturbances of vision, displacement of the eye, orbital abscess, inflammation of the meninges, syphilis and forms of necrosis, obstinate polypi, especially when combined with polypoid degeneration of the middle turbinate, frontal disease caused by ethmoidal obstruction, pus in the antrum of ethmoidal origin, severe or obstinate forms of ethmoidal suppuration with pus flowing into the post-nasal space causing laryngitis, bronchitis, asthma, or other disease of the upper air passages.

An advantage possessed by the ethmoid cells over the antrum, frontal and sphenoidal sinuses as regards treatment, is that the former are accessible by intra-nasal procedures, and they can be opened, curetted, drained and treated without external openings. It is true that when the upper part of the nostril is narrow from a general narrowing of the nose or from a bent septum, it may be difficult to gain access to the cells; but, usually, after removal of the anterior end of the middle turbinate, (which is often diseased at the same time) we are able to penetrate the cells, break down the cell walls, give vent to the pus and curette the secreting tissues. In my own experience, I have found almost no cases where other than persistent, perhaps long continued intra-nasal treatment has seemed

to me to be advisable. It is not easy to say exactly what the terms *conservative* and *radical* mean when applied to the thorough, instrumental treatment of ethmoidal disease. If removal of a considerable portion of the middle turbinate, followed by opening and curetting of the cells is conservative, then I should say that this treatment is very satisfactory in nearly all ethmoidal affections, even the severe forms, although a certain amount of discharge may persist after the active symptoms have been relieved. I am not in favor of too vigorous treatment especially in the region of the orbit or the cribriform plate, as an element of danger is unnecessarily added, out of proportion to the symptoms of the patient.

The fact that some of the ethmoidal cells may project so far into the frontal duct as to cause frontal sinus disease may lead to the necessity of a radical frontal operation with incidental treatment of the ethmoid in order to gain adequate drainage into the nose, but this phase of the subject would fall more naturally into the discussion of frontal sinus disease.

For the removal of obstructive polypi or the ethmoidal bulla, causing retention of secretion, pressure on the septum, pain or headache, the snare, curette, punch-forceps or various hooks are sufficient to remove the hypertrophies, drain the diseased cells and permit the use of antiseptic solutions. Where pus has extended in such a manner as to cause trouble with the eye, exophthalmos or other displacement, the same sort of intra-nasal treatment is to be carried out with the object of establishing sufficient nasal drainage as soon as possible. In my experience, it has not been necessary or advisable to operate externally except where there was an orbital abscess or where the pus had already formed or was on the point of forming an external opening, for instance, near the root of the nose. I have seen cases of syphilis and necrosis where an external opening was necessary in order to remove the diseased bone.

I cannot recall any instances, other than these orbital abscesses and cases of necrosis, where I have operated other than intranasally for ethmoidal disease uncomplicated by disease of the antrum, the frontal or sphenoidal sinus. Perseverance on the part of the physician and great patience on the part of the sufferer from the disease are of the greatest importance, and even then there may remain a certain amount of nasal discharge, but if the active symptoms of obstruction, pain, and headache are relieved, the continuance of a moderate amount of nasal suppuration is easily tolerated.

THE SPHENOIDAL SINUS.*

BY J. W. GLEITSMANN, NEW YORK.

Although several publications on diseases of the sphenoidal sinus appeared before 1892, it was the late Max Schaeffer of Bremen, who, by his exhaustive treatise based on 19 acute and 53 chronic cases, drew the medical attention to the importance and frequent affection of this locality. Subsequent observers and also the writer of this essay could not confirm the relative proportion of his acute and chronic cases, more than one of the former to three of the latter, but the symptoms were described by him so completely and minutely, that very little new has been added since. We still follow in principle his method of entering the ostium and the sinus, and reserve the newer, more radical measures to protracted obstinate cases and to those with extension to the orbit or neighbouring parts, a feature which Dr. Berens will enlarge upon.

The sphenoidal sinus can either be diseased by itself alone or in conjunction with other sinuses, of which we have to consider for diagnostic purposes principally the posterior ethmoidal cells, as their discharge appears in the same locality, viz: the olfactory fissure. To differentiate the secretion of these two cavities, it is necessary to introduce a probe, in the well known manner, between the middle turbinate and the septum, into the sphenoidal ostium, which proceeding being easy with a spacious, open olfactory fissure, in other cases requires either pushing away of the middle turbinate or Killians' long nasal specula or, most advantageously, resection of part of the turbinate. The errors to which we may be subjected in seeking the ostium are graphically stated in the drawing by Hajek which I hand you for inspection. If after thorough syringing of the sinus and cleaning of the olfactory fissure, no pus appears in the latter, we can exclude disease of the posterior ethmoidal cells. But if we discover pus after one or more of such proceedings, it is necessary to exclude the possibility of pus running from the ethmoidal cells into an otherwise healthy sinus by ascertaining if only one or both cavities are affected. If we insert a tampon into the well cleaned sphenoidal sinus, and leave it there several hours, pus will flow out through the ostium in case of its being dis-

* Read before the Twenty-seventh Annual Congress of the American Laryngological Association, held at Atlantic City, June 1 to 3, 1905.

eased; whilst, when both cavities are affected, the anterior part of the tampon is also covered by secretion.

I do not consider it to be within my province to give a complete symptomatology, but shall enumerate only such symptoms as, in my opinion, call for either conservative or radical treatment. The majority of the acute cases, as also the few observed by the writer, take a favorable issue on the pent-up secretion being released, although in some instances especially if complicated with severe acute coryza, the symptoms are well pronounced, fever, insomnia, general debility. Headache, sometimes very severe, is more frequent than in chronic cases; as a rule the pain is in the region of the occiput, in the rear of the bulbous, also in the frontal or orbital region. At the commencement of acute cases, the amount of secretion in the nose and rhino-pharynx is often very small; the middle turbinate is turgid, swollen, pressing against the septum; and when it is pushed away, the secretion having free exit, is seen in the olfactory fissure. The majority of acute cases, as formidable as they may sometimes appear, take a favorable issue without radical operation; but, generally, the ostium must be enlarged and kept well open by removal of part of the anterior wall with suitable hooks and nippers, a proceeding which I still consider the conservative method. Disinfectant, later astringent solutions, cauterizations, sometimes curetting of the mucous membrane will constitute the treatment. In the extremely acute cases, brought on by severe infection, with danger of extension to the orbit or sella turcica, radical measures cannot be long delayed.

Chronic affection of the sinus is either a sequela of the acute form or is simultaneous with disease of other sinuses and due to the same infection. The subjective symptoms are of a varying nature and are less pronounced than in acute cases. The pain is less severe, either in the occiput or temples or frontal region. Sometimes vertigo is present on bending down, stiffness of neck, neuralgia, tic douloureux, also aprosexia, aversion to work, even mental depression. As in the majority of chronic conditions the other sinuses are diseased at the same time, it is difficult to ascribe one or the other symptoms to the sphenoidal sinus alone. We observe, instead of the liquid secretion of acute cases, more frequently a crust at the middle turbinate as well as in the rhino-pharynx, which when removed from the former makes the pus appear between the septum and turbinate. The quantity of the secretion is subject to great changes; sometimes it has a penetrating, disagreeable odor, which was the reason that at one time sphenoidal sinus disease was considered the principal cause of so-called ozaena.

At inspection, we find the changes in the olfactory fissures more developed. The mucous membranes are thickened, in a state of hyperplasia, which is apt to involve also the septum, polypoid excrescences, small polypi, all impeding the outflow of pus from the sinus, make their appearance. If the disease has assumed this character, conservative methods will be of little avail in my opinion, and a thorough opening of the sinus with more or less radical removal of its integument will be necessary. Nevertheless in one of my cases of this nature, I succeeded by less heroic means in effecting a cure. The patient presented the peculiar feature of having the greatest discomfort whenever a small crust formed at or near the ostium but felt well when the sinus was firmly tamponed with aseptic gauze. After gaining thorough access to the sinus, enlarging the ostium, repeated curetting and cauterizing and proper home treatment the case took finally a successful issue.

I may be permitted to say a few more words about the more vital affections of the sinus, necessitating radical measures. The relations between the posterior ethmoidal cells and the sphenoidal sinus to the orbital canal have recently been very carefully studied and beautifully illustrated by Onodi, and that disturbances of vision, even blindness can be due to diseases of these cavities has been confirmed by cured cases on record as well as by autopsies. Cerebral lesions often ushered in by fever and mainly due to perforation of the upper wall, were tabulated by Dreyfuss, a fatal hemorrhage by perforation of the upper external wall into the cavernous sinus is recorded by Scholz. Secondary hemorrhages were reported by Hinckel, Hajek and the writer, which were arrested by anterior and posterior tamponade, another by Myles after trephining and curetting, necessitating ligation of the external carotic artery. Although secondary tumors due to extension from other localities occur not so seldom, primary tumors are, according to Citelli, very rare, and he could find only 5 cases in addition to his own. It is superfluous to say, that all the last named affections require radical and drastic measures, but when applied in time and carefully executed, we can even in a fair number of desperate cases expect to relieve the patient and to save his life.

46 E. 25th St.

THE COMPARATIVE RESULTS OF CONSERVATIVE AND RADICAL METHODS OF TREATMENT OF DISEASE OF THE SPHENOID SINUS.*

BY T. PASSMORE BERENS, M. D., NEW YORK.

In considering the comparative results of conservative and radical methods of treatment of the sphenoid sinus, it is perhaps, wise to define what is meant by each method, as operators on the sinuses differ widely in their definitions. Taken in a broad sense *conservative treatment* may be defined as the treatment of the sinus by various medicaments applied by means of various devices through the ostium,—possibly through an artificially enlarged ostium,—after access to it has been gained by minor surgical measures, such, for instance, as the removal of a nasal obstruction caused by an enlarged turbinate or by a septal deformity. *Radical treatment* of the sphenoid sinus may be defined as any procedure whereby as much as possible of the whole of the interior of the sinus is exposed by removal of the anterior wall, its contents removed and the remaining cavity treated in accordance with modern surgical ideas: in other words, it is an attempt at obliteration of the sinus as a closed cavity.

Conservative treatment is always accomplished by way of the intra-nasal route; while radical treatment is accomplished by way of one of several routes. The anterior wall of the sinus may be removed by way of the intra-nasal route through a part of the ethmoid labyrinth; or by way of the antrum of Highmore and ethmoid cells, when a *multiple sinusitis* involving these sinuses is present; or by way of the frontal sinus through the ethmoid cells, when this group is involved in the sphenoid disease. The writer considers a radical operation on the sphenoid sinus via the nasal route as quite feasible in many cases.

A comparison of results from the various procedures should take into consideration the topography of the sphenoid region in each individual as well as the character of the disease. Obviously, a marked deflection of the septum or a large middle turbinate will influence the operator in his course of procedure; just as the presence of disease of contiguous pneumatic cells will guide him in selecting the route. Indeed, it is an established fact that the judi-

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ous treatment of encroaching diseased ethmoid cells will prevent the necessity of operative interference with the sphenoid in cases of *pyosinus* of the latter,—the term *pyosinus* being used to indicate that the cavity is acting as a reservoir for pus formed elsewhere (Killian, quoted by Hajek, *Archiv für Laryngologie und Rhinologie*, Bd. XVI.) Again, in the treatment of sphenoid disease associated with or caused by multiple sinusitis, including the ethmoid, and antrum or the ethmoid and frontal, it is necessary to treat those cavities also. The particular external operation to be employed depends on the preference of the operator; while the operation is extended thence by way of the ethmoid labyrinth into the sphenoid sinus.

The writer looks on the sphenoid sinus from a purely clinical standpoint, as the most posterior of the ethmoid cells; and it is rarely indeed that the probability of disease of the ethmoid cells can be excluded, when making a diagnosis of sphenoid disease. He has seen only 7 cases in which he could be fairly certain that the sphenoid alone was diseased; while in 37 other cases he has found its disease associated with or caused by disease of the ethmoid, of which number 28 had also either frontal or antral disease, or complete *pansinusitis* of the affected side.

Of the 37 cases of multiple sinusitis in which the sphenoiditis formed part of the disease, one was a case of *pansinusitis* involving all of the accessory sinuses of the nose except one frontal sinus; 3 were cases of *unilateral pansinusitis*; 17 were cases of *sphenoiditis* with tissue changes in the sinus complicated by *ethmoiditis*; while of the remainder, 20 cases were of *multiple sinusitis* involving the antrum of Highmore, the ethmoid labyrinth and the sphenoid sinus, and 7 were cases involving the frontal sinus, the ethmoid labyrinth and the sphenoid sinus. In many of the cases disease of the sphenoid was not suspected until its presence was noted while operating on the ethmoids, the ethmoids communicating by disease with the sphenoid.

Of those affected with sphenoid disease alone, the writer acknowledges the possibility of error in his diagnosis; he is reasonably certain, however, that the diagnosis was correct because of the results obtained from the treatment. Of the 7 cases, 2 were acute and 5 were chronic. One of the *acute cases* yielded rapidly to conservative measures,—adrenalin and douching through the ostium, which was readily accomplished because of the peculiarly normal anatomical topography of the nose. The second case was successfully treated by lavage and medicaments through the ostium

only after the removal of adenoids and the middle turbinate,—the removal of the turbinate being necessary on account of the presence of a deflection of the septum. The cure of one of the *chronic cases* was affected by treatment of the sphenoid sinus carried on through a slightly enlarged ostium, after the removal of a spur from the septum and the removal of an enlarged middle turbinate. Another was cured by the free application of Mono-Chlor-Phenol (Ortho) applied through an enlarged ostium after the removal of the middle turbinate. The after-treatment in both of the latter cases was by means of Argyrol applied on a cotton-armed applicator. In these cases no lavage was resorted to. The third case was cured by removal of the middle turbinate, breaking away overhanging healthy ethmoid cells and through them entering the sphenoid sinus. The ostium was not found. This treatment was necessary because of the presence of a large deflection of the upper posterior end of the septum.—The fourth case was of especial interest because there had been a fairly thorough curettage of the ethmoid region before it came under the writer's observation. The disease was cured by the removal of a large amount of granulation tissue from the cavity of the sphenoid after the removal of its anterior wall. The fifth case has been under treatment for about ten years, refusing an operation because of a severe hemorrhage experienced many years ago during a curettage of the ethmoids, while in other hands. These last two cases were probably originally cases of multiple sinusitis.

Of the number of *multiple sinusitis* cases in which the sphenoid disease was a prominent factor; 27 were cases of ethmoid and sphenoid disease; while 20 involved sphenoid, ethmoid and antrum of Highmore; and 7 involved sphenoid, ethmoid and frontal. Owing to the time-limit set upon the reading of this discussion, it is impossible to go into the details of these cases. It will suffice to say that they were all cases of well-marked suppurative disease. Of the cases of sphenoid and ethmoid disease, 10 were acute or subacute; while the remaining 17 were chronic. Of the acute cases, 3 yielded to Adrenalin, douching and other mild measures; 4 required the removal of the middle turbinate, because either of its enlargement or of a septal deformity. Three cases after several months of treatment in vain, were operated upon by the removal of the ethmoid and the anterior wall of the sphenoid through the nose under cocaine anaesthesia. These acute cases all promptly recovered.

Of the chronic cases of combined ethmoid and sphenoid disease, 17 in number, not one yielded permanently to conservative treatment after a fair trial; they were all eventually operated upon by removal of the posterior ethmoid cells and the anterior wall of the sphenoid sinus, except two who would not submit to operation and have passed from observation. Of the cases operated upon, those in which the operation was most radical, namely by the total removal of the ethmoids and a *large opening* made in the sphenoid, all made good recoveries. Five that were incompletely curetted have been troubled with crust formation and a return of many of their symptoms.

The writer's experience leads him to believe that the treatment of chronic sphenoid disease, when complicating a chronic multiple sinusitis involving the ethmoid and either the maxillary antrum or the frontal sinus, yields the best results from operative procedures carried out by way of the maxillary antrum or frontal sinus, and thence through the ethmoid labyrinth into the sphenoid sinus. The results from these operations have been satisfactory. Of the 27 cases of extensive operation but 7 still have to resort occasionally to treatment for the removal of crusts in the nose. The favorite location of these crusts is along the site of the ethmoid cells. In each instance, the crust formation is directly attributable to an *incomplete removal of ethmoid cells*. Crust formations have not been noted in the sphenoid sinus after this operation, and where the operation on the sphenoid has resulted in a permanent large opening pus has promptly disappeared from this sinus in every case. In 3 cases, the large openings resulting from the operations subsequently closed, and in each of those cases pus accumulated, while in one case, the symptoms (Tic Douloureux) returned. These 3 cases were promptly relieved by again removing the anterior wall.

While the writer is fully aware that the number of cases herein reported is small and the description of the cases inadequate, yet he feels that the careful study he has made of each individual case, though not permitted to be given in this brief discussion in full, justifies him in presenting the following conclusions:

Acute uncomplicated empyema of the sphenoid sinus is amenable to conservative treatment, provided that the ostium is accessible through the nose.

Acute multiple sinusitis involving the sphenoid is amenable to conservative treatment, provided drainage is not blocked by anatomical deformities or diseased conditions. Anatomical deformities

may render surgical procedures necessary, to gain access to the ostium.

Acute or chronic pyosinus of the sphenoid can be cured only by removal of its cause, i. e., by treatment of the disease of the ethmoids.

Simple chronic empyema of the sphenoid sinus alone, when unaccompanied by serious tissue change in the interior of the sinus, is amenable to conservative treatment.

Chronic empyema of the sphenoid sinus when, however, it occurs as a complication of diseases of other sinuses, as it frequently does, or when accompanied by tissue changes in its interior, can be cured only by radical procedures involving not only the destruction and removal of all of the tissues diseased, but also the removal of all other tissue that may be a hindrance to drainage and to after-treatment.

The tendency of the anterior wall of the sphenoid sinus to reform is a sufficient warrant for as complete a removal of it as possible.

The location of important vessels in the region of the sphenoid is a strong argument in favor of the maxillary route when the antrum is involved, for this route gives double access to the sphenoid sinus and thus the more readily permits of proper instrumentation.

35 Park Avenue.

GENERAL DISCUSSION.

SYMPOSIUM ON SINUS DISEASE.

DR. HENRY L. SWAIN.—I most heartily concur in what has just been said, that the Association should feel itself highly complimented that before this body there has been presented such a complete exposé of the subject of sinus disease, not only the eight papers this afternoon, but also the very illuminating discussion of the morning on the acute phases of the subject now at hand. There is an old saying that "Every surgical operation is a confession of failure," and it seems to me to-day that we have a beautiful illustration of that thought. Those of us who have observed a great many acute cases of sinusitis and have trans-illuminated as routine work all severe cases of acute rhinitis, will bear out the statement that a large number of the cases of acute inflammation of the sinuses recover spontaneously; here nature has been sufficient. The parts are so normal in their making that nature cures them by her own

method of free drainage. That we have to resort to other measures of treatment is a confession on the part of nature, that failure is due to lack of drainage in two senses. The thing which interferes most with the drainage from the cavities, is the formation of granulation, or oedematous tissue. Pus, when retained for any length of time on any mucous membrane, always tends to the formation of polyp-tissue, and therefore the process of cleansing is most important, not merely the cleansing to get rid of the accumulation in and around the cavities, but to stop the resulting pathological changes in the mucosa. We may have to remove or reduce the swollen tissue, and, failing to reduce the inflammation in the sinus by these measures, we are called upon to perform the operations which we have heard discussed more in detail this afternoon. All this, it seems to me, has been presented in a very able way, and has been most valuable to me. I would like, before sitting down, to ask Dr. Coakley whether in all of his 104 successful cases (and I congratulate him for this splendid result), the frontal inlet into the nose closed. (Answer, "yes".) It seems to me that represents a step in advance in the treatment of these cases, when a gentleman of Dr. Coakley's ability can say that by this method of operating he has produced absolute radical cures, as in mastoiditis, when we obliterate the cavity. We cannot do that with the ethmoid, sphenoid or with the maxillary antrum. I would then like to ask Dr. Coakley if he would, in closing, state which method he prefers in operating, whether the removal of the front wall or lower wall when he does his so-called "radicals"?

DR. CLEMENT F. THEISEN.—During the past winter I had the pleasure of seeing Dr. Coakley perform his open operation, and later in his office, saw quite a number of his cases in different stages, in which the radical frontal sinus operation had been performed by the open method, and I must confess I have become an enthusiastic advocate of that method. It seems to me that in every frontal sinus operation, the thing to be sought for is to get a thorough obliteration of the sinus. I do not see how you can be sure of *positively* accomplishing that by any other method. I do not see how you can be absolutely certain after the completion of the operation, whether or not you are going to have a complete obliteration of the frontal sinus, if the wound is immediately completely closed. Since seeing Dr. Coakley's work, I had the pleasure of performing two operations by the open method, one in a case of three years' standing, with extensive ethmoid involvement, and I am certain that the frontal sinus in this case is obliterated,

and that the naso-frontal opening is closed. The nose is absolutely free from any secretion whatever. I think, too, it is an important thing to remember what Killian says in his valuable atlas of the accessory sinuses of the nose, that we should look for large anterior ethmoid cells in performing the radical frontal sinus operation, which so frequently dip well over the supra-orbital wall, and also look for all pockets of pus and orbital recesses. I think the most important thing is to get out every bit of mucous membrane from the frontal sinus. Otherwise, we cannot be certain of future results being good. My experience in this work has been very limited, but I simply wanted to add my slight testimony to what Dr. Coakley has said, and to advocate the open method.

DR. GEORGE L. RICHARDS.—I have a few specimens here that illustrate particularly well the impossibility of having one operation, even though it be of the most radical nature, which will satisfy all cases. Here, for instance, are two frontal sinuses of enormous extent. Here is another which shows the frontal sinus going a long ways backward and another one with the fronto-nasal duct draining into the antrum on each side. In several of these specimens the frontal sinus communicates with a number of the ethmoidal cells.

It seems to me in the Killian and other radical operations, we will encounter the occasional case where it is either impossible or impracticable to treat the sinus in such a way as to effect an absolute cure. Dr. Coakley's method of obliterating the sinus appeals to me more than the method of Killian. I have been in the habit of operating underneath the ridge of the inner angle of the eye, first by the Caldwell-Luc method and latterly by keeping the cavity packed until its absolute obliteration has taken place. This requires from several weeks to four or five months, but the resulting deformity amounts to nothing. It is hardly noticeable at the inner angle of the eye, and when a cure has finally resulted there are no recurrences. In the Killian operation, it must be borne in mind that there is a certain amount of danger in connection with it. You may occasionally find one sinus small and the other large, and you may get close to the brain above the supra-orbital ridge on one side and not on the other. As Dr. Theisen just said, the rule in any frontal sinus work is to get obliteration if possible. Make the widest possible opening into the nose and destroy all contagious ethmoidal cells.

Another important point in connection with this discussion should be mentioned, namely, the view which the patients themselves

take with reference to the question of operation. They are often satisfied, and you have to content yourself to let them stay so, with a slight muco-purulent discharge. If you have obtained fairly good drainage they will prefer this to a more radical operation with the chances of a long course of after treatment. This slight muco-purulent discharge annoys them very little. They simply regard it as a little catarrh. I have one patient who had a frontal sinus empyema discharging externally. I took off the middle turbinate and enlarged the fronto-nasal opening and told him that a radical external operation ought to be done. He, however, on the establishment of better drainage, declared he was well and said he had always had catarrh, and was entirely satisfied with the result, although there is still a muco-purulent discharge from the sinus, and from the rhinological standpoint he is not cured.

This last specimen illustrates a point which Dr. Berens has made, namely, that the sphenoidal is practically and anatomically a posterior ethmoidal cell.

DR. OTTO T. FREER.—I permit myself to change the subject from the frontal sinus to the maxillary antrum, as I do not think that the radical operation of the latter cavity through the nasal wall has been considered in this discussion. This procedure includes as a preliminary the removal of a large portion, usually the anterior two-thirds of the inferior turbinated body. Although objection has been made to sacrificing a part of this structure, my personal experience has rather convinced me of the harmlessness of doing so. Though I have frequently resected large portions of the inferior turbinated bodies when they blocked the nares from hypertrophy, I have never seen the permanent crusting and scabbing mentioned by others; and I think that where it is found after turbinotomy, its continuance is due to pathological conditions such as abnormal secretion from suppurating sinuses or metaplasia of the ciliated epithelium of the nasal mucosa into pavement epithelium as the result of chronic purulent rhinitis. In my experience, if the mucous membrane of the nasal cavity be healthy, crusting and scabbing after resection of the inferior turbinated body is but temporary and ceases after cicatrization of the wound, even though the naris be made abnormally roomy.

Réthi was the first to perform the radical intra-nasal operation for empyema of the antrum mentioned, a method which I think is destined largely to supplant the often needlessly extensive Caldwell-Luc procedure. In the intra-nasal operation, nearly the entire

nasal wall of the antrum, from a little above the inferior border of the middle turbinated body above to the floor of the nose below, and from the anterior end of the middle turbinated body in front as far back as to the posterior third of the lower turbinated bone, is removed with trephine, burr and punch forceps through the nostril. The operation accomplishes in most cases all that the Caldwell-Luc does, and in a far more conservative way. It is eminently the method for the rhinologist, whose peculiar instrumentarium and skill enable him to avoid the more direct but more damaging route of the general surgeon through the facial (buccal) wall. Since Réthi's first publication, Claoué of Bordeaux and Holbrook Curtis of New York have advocated the procedure in a somewhat less radical, and I think, therefore, less efficient manner than Réthi. As the operation is a new one, my experience is still limited but very satisfactory. I supplemented it by a number of cadaver operations and found that usually the field of operation is quite accessible, and that the view of the interior of the antrum obtained is surprisingly extensive, considering that one operates through the nose. I employ a pair of large curved punch forceps, Rhodes', that enable one to reach every part of the antrum after it is opened through the nasal wall, and permit the cutting off of granulations and polypoid masses. A flexible curette may also be introduced, and palpation of the posterior one-half to two-thirds of the cavity is possible with the little finger.

As the intra-nasal resection of the nasal wall of the antrum represents the last step of the Caldwell-Luc operation, the latter is already half done should it become indicated after all. The great majority of the cases that have been reported, however, recovered as the result of the intra-nasal operation, which establishes the freest drainage and, what is just as important, perfect ventilation of the antrum. In addition patients will submit to it when they will object to having the bones of the face attacked.

DR. JOSEPH H. BRYAN.—There has been a very radical wave which has been going over the whole world, the continent of Europe, the British Isles and our own country in regard to the treatment of these suppurative conditions of the accessory sinuses. There is no question about it, there has been entirely too much done, and in too radical a way, but nevertheless, taking first the maxillary sinus, it is necessary to be radical in the majority of cases, that is, in the chronic suppurative cases of long duration. In the subacute or chronic abscess of short duration the intra-

nasal methods, such as have been spoken of, may be sufficient; but I do not believe that it is possible to cure these cases of several years' or more standing by such methods, and it thus becomes necessary to remove the anterior wall of the sinus. With regard to the curetting of this sinus, we find the mucous membrane very much thickened, and it is only possible to get the curette down to the bone through a large opening in the canine fossa. These cases are very obstinate and often defy the most radical methods to relieve them.

With regard to the frontal sinus operation, in 1890 I did my first sinus operation, and I tried it by the open method. I treated that case for one solid year, operating on it twice. The parts closed so that it was impossible to make any local applications through the external wound. I was unduly timid at that time and did not remove enough of the ethmoid, although I did make a sufficient passage from the fronto-ethmoid region to bring about what I supposed was sufficient drainage. Unfortunately, the granulations were weak and broke down, but the external wound closed so that it was impossible to keep the parts open. So that is not a method by which you are positively sure you can bring about a cure after operating even a second time. I wish to take exception to the statement that it is impossible to cure these cases except by the open method. I have cured the majority of my cases by the closed method. I have tried every method known to-day except the Killian. Positively I do not understand this operation. I have done it several times on the cadaver, but when I see cases going around as in Europe, showing a furrow sufficiently deep to put your forefinger in, and at the same time cannot feel sure then that a cure has been accomplished, I cannot bring myself to operate by this method. I saw one case of Killian's which had to be operated on three times, so that is another evidence that the Killian method is not a positive cure. I have resorted to the so-called Caldwell-Luc method in the majority of my cases and all are well to-day. I am free to say all have not been cured by one operation, however. Why send these patients out looking like a lot of flatheads, when by one or two operations you can keep their normal appearance? Now, in regard to the cure by the so-called closed method. The same process of cure goes on that occurs in the open method, granulation tissues form to fill the cavity. I have been unfortunate enough to open two cases unnecessarily; in one the sinus was filled with firm bone tissue, and in the second case it was filled with granulations so firm it

was difficult to remove them with the curette. I believe, however, that in this closed method you do not disfigure your patients to the same degree as by the Killian method.

DR. LEWIS A. COFFIN.—It is very difficult to determine what is conservative and what radical. Where one method begins the other ends. Both words are capable of comparison and either may modify the other, so that the line of demarcation is exceedingly indistinct. It strikes me that we will come to consider not what is the most conservative and what the most radical, but rather what method best lends to a satisfactory cure of the disease, and that will be, I am convinced, the most conservatively radical thing that can be done. I have been particularly interested in this symposium, and I congratulate the writers on the excellent and conservative tone of all papers presented. The writers have been hampered perhaps to a certain extent by the fact that each has been obliged to deal with a single sinus, because in practice most cases are complicated, one sinus being associated in disease with one or more others. Considerable discussion has been presented on the maxillary antrum. I am thoroughly in sympathy with what Dr. Bryan has said with regard to the external opening of that sinus where radical work is necessary, although it is not necessary at first; the intra-nasal operations can be done and the more conservative method tried, to be followed by the more radical, if necessary. I am particularly interested in the frontal and ethmoidal sinuses. In 1892, in Washington, in a symposium somewhat similar to this, I had the honor to read on the frontal sinus, and then named and described the open method, recommending it as what to me at that time seemed the best for all cases. I reported having cases that were not in any way scarred and in whom there had been no recurrence. I have no case to-day that is not well, but I have one case in which it was necessary to operate the third time. It was a hospital case and the external opening never closed completely. At the third operation on the boy I did practically a Killian, and the boy has since that time made a complete and rapid recovery. The trouble was that I did not get into his anterior ethmoidal cells, which persisted in keeping up the discharge. Now I believe the open method is applicable to certain classes of cases only. Given a small, smooth sinus independently diseased the open method, is, to my mind, the operation of choice. If obliged to do work between the frontal sinus and nose, enlarging the frontal duct by the destruction of the ethmoidal cells about it, your opening is made particularly large, and particularly large in comparison with

the sinus to be filled with granulation, I think you will have no trouble and no recurrence.

But lately, I have done the Killian in several cases, and I must say that I am thoroughly converted to this method of operating in the majority of cases; that is, in cases of large, irregular sinuses complicated by ethmoiditis. In these cases that I have done, three only, I have no flat heads, and in fact practically no deformity. There are men here who know the cases. In one case, a young man in whom I took off the entire anterior wall of both sinuses, leaving neither septum nor zone of bone over its site, there is no deformity of the forehead. In a case I treated by the open method I took off the entire anterior wall, leaving a narrow strip of bone over the septum; there is no deformity, except the retraction at point kept open for packing. She had as large sinuses as I ever saw, but very regular. The deformity is greater, however, than that following the Killian method.

Most of our failures come, I think, from the involvement of the ethmoidal cells along with the frontal sinus; and unless we tackle these, it is very difficult to get our frontal sinus to obliterate or the external opening to close up. This can best be done by the Killian method; and if the sphenoidal sinus be diseased, it can be opened most easily by way of the ethmoidal labyrinth.

Now I want to say a word in regard to the ethmoidal sinus. I believe that we do the most conservative work by the external operation. That is to say, a case comes with an involvement of the ethmoids demanding operation. If there is a fairly healthy middle turbinate it seems too radical to take out the middle turbinate, as must be done either by intra-nasal operation or by going through the antrum. By the external operation we need not necessarily sacrifice either the inferior or the middle turbinates. If we have disease of the anterior ethmoidal cells then the ethmoidal route should be used, for reaching the sphenoid. If not, I almost wonder if it would not be a fair proposition to go through the antrum, though healthy, into the sphenoid. I feel very much opposed to this operation on the ethmoids and sphenoids through the antrum, by which the entire destruction of that internal wall of the antrum is caused. I cannot see in the future condition of such a case anything that approaches a functioning nostril, and I have my doubts as to the future well-being of the patient. Dr. Berens brought one to me the other day which he had operated upon most thoroughly, opening all the sinuses into one, and it was absolutely clean, but the case was of recent date, and what the con-

dition of that mucous membrane will be in a few years is a great question to my mind.

DR. THOMAS J. HARRIS.—I hope that in our discussion we shall not lose sight of the titles under which the various writers have written their papers. I think we have turned too much into a discussion as to the best operation for the relief of empyema of the frontal sinus. I am not unmindful of that stirring paper of Dr. Mackenzie last year about radical work, and I am rather hoping he has a little fire left to use before we get through. It seems to me we have to bear in mind this point, that leaving out the affections which Dr. Coakley, among others, has enumerated in which the radical operation is required, there is a large group of cases of sinus disease that fall into a class by themselves, *i. e.*, of a certain amount of discharge without other prominent symptoms in which it is an open question if any radical procedure is demanded. I hope, too, we shall not lose sight of the fact, which the speaker has emphasized, that we must regard these sinuses together, not separately. If we forget this we forget the most important thing. The writer in the paper on ethmoiditis did not dwell on this sufficiently, that cases of ethmoiditis are not simply involvement of the ethmoid cells but cases often associated with disease of the sphenoidal sinus. Almost invariably, inflammation of the frontal sinus has been associated with ethmoid disease, and it is equally true of the maxillary sinus. In fact, using a quotation of Dr. Lermoyez, wherever you have an antrum of Highmore holding one and a half cu. cm. you have it simply acting as a receiver. Are we finding it necessary to-day to operate upon our cases for the simple question of chronic discharge? Are we not able to get sufficient benefit to satisfy our patients without the radical treatment which has been very much dwelt on to-day? The statistics collected by Dr. Turner, of Edinburgh, will bear emphasizing. As I recall them he has collected 42 cases of intra-cranial complications causing death, also 24 cases of death following operation on the frontal sinus, and in my knowledge there have occurred in the last year three or four besides that. Of these 24 cases in which death has resulted, following the operation either in the frontal or other sinus (23 of the operations known), 17 followed the Luc operation, showing that operation certainly is not free from danger. It seems to me that where we have indications as clearly stated as by Dr. Coakley there is no question about the necessity for radical procedure, but it is a very grave and large question. I should be very glad to hear from others along this line. Let us not lose sight

of the fact that we can very easily be dealing with complications that will produce very serious, if not fatal, results in these operations upon either the sphenoidal or frontal sinuses.

DR. J. PAYSON CLARK.—There is one point in regard to empyema of the antrum which has not been touched upon in the papers or discussion which seems to me should be mentioned, and that is that there are two distinct forms of empyema as regards etiology; one is the empyema arising from some disease of a tooth, and the other is the empyema arising from infection through the nasal cavity. In my experience those cases arising from a bad tooth are very amenable to treatment. I have in mind one case where a purulent discharge from one nostril had existed for seven years. On the removal of a diseased tooth and washing out for three weeks twice a week it was entirely cured. I think one point wants to be remembered, that if a tooth is the source of the infection it acts very much as a foreign body, but when it is removed the case gets well. Another point regarding the radical or Luc operation on the antrum and packing the antrum afterwards. I used to pack it with gauze, but I found that it caused a great deal of pain and discomfort, and I could not see there was anything to be gained by it, so in the operations I have done in the last two years I have not packed the antrum at all. I have opened the canine fossa, explored the antrum, removed the thickened membrane, made a large opening into the nose, then allowed the wound in the cheek to close. The patient has been much more comfortable after the operation, and I have not been able to see that the result was not just as good as with packing.

With regard to the operation on the frontal sinus, my experience in radical operations has been very small; the only operation I have done has been the Ogsdon-Luc operation. I shall still, with my experience, continue to try that operation on cases where a more radical operation than an intra-nasal one seems to be called for.

DR. J. PRICE-BROWN.—I should like to say a word or two on disease in the antrum and ethmoid cells. I was glad to hear Dr. Bryan speak so favorably of the operation through the canine fossa. In my experience it is an excellent method. It has certain advantages which the radical operation has not. Radical operations in which you remove portions of the internal surface of the antrum, put the patient in a condition in which he cannot, as a rule, treat himself; the operator or nurse has to do it for him. After an operation through the canine fossa the patient can attend to the wound admirably and practice irrigation if needed. Another point: in

a good many of our cases the disease does not arise from a diseased tooth but from inflammatory action or polypoid thickening in the neighborhood of the ostium, and by making an opening of sufficient size through the canine fossa you can curette the antrum much more thoroughly than through the inferior meatus. It is not so radical an operation. My method of treatment has been to make a good-sized opening into the antrum, then to put in a soft rubber tube, the outside end being rolled upon itself. This tube is permitted to remain open, but by its pressure it prevents granulation. If left in for a sufficient length of time, you have, on taking it out, a perfect sinus. This can be left open as long as required for irrigation, and then allowed to close. If the anterior ethmoid cells are diseased the probability is that the frontal sinus is also diseased. In like manner disease of the posterior cells is usually accompanied by disease of the antrum of Highmore.

The treatment of the ethmoid cells alone has rarely been sufficient to produce a cure in my hands, but the operation spoken of, and treatment through the antrum, together with curettage of the cells, has produced a cure.

DR. EMIL MAYER.—One group of cases has been omitted in the descriptions here presented, and those are the acute cases of frontal sinus disease. In these the patient rapidly passes into a condition of extreme danger of his life. There are early meningeal symptoms without involvement of the middle turbinates, the principal complaints being violent headaches and extreme tenderness over the sinus. In these cases removal of the middle turbinate will be of no avail and prompt external operation is indicated.

In the operation for more chronic conditions, I believe that the suggestion made by Dr. Coakley is applicable, that is that there should be a skiagraphic picture on hand. The ordinary method of making such pictures consist in having the weight of the patient on the glass, but there are instances given where the glass has been broken by this method. This has been overcome by a table devised by Dr. W. M. Brickner, which consists of a top so arranged that the plate is placed under the board and hence not coming in contact with the patient at all.

Regarding the radical operation where all the sinuses are cleaned out, it does certainly seem that every other method should be patiently tried first before resorting thereto, and I recall the appearance of patients who have been thus operated, presenting two unsightly horns on the forehead from which they pulled out approximately

a yard of gauze on each side, and then drawing out their cheeks would pull out a similar packing from each antrum of Highmore, and do this for a long time until healing was established. The operation itself as I have seen it is such a bloody one, the patient swallowing enormous quantities of blood, that I would like Dr. Berens, in closing the discussion, to state if he has in any way been able to modify the operation to avoid this great loss of blood.

CLOSING DISCUSSION.

Dr. Robert C. Myles. The discussion has been extremely interesting and we are indebted to those who have spoken so freely. It is the only way in which we shall ever solve this problem. I commenced about fifteen years since to perform a series of these frontal sinus operations and I have done all the operations except the Killian. My experience has been that I have had in many cases good results with all the methods but my best results, taking them all together, have been by the conservative methods. When we think of the death rate of twenty-four cases collected and reported by Turner (and how many more there are, no one knows,) it is something to make us hesitate and think more.

If one can cure eighty per cent of all sinus cases by the internal conservative route, he has only twenty per cent to treat radically.

It is necessary to make large openings into the seriously diseased sinuses and openings which will remain patent in order to effect cures by the internal conservative treatment.

DR. CORNELIUS G. COAKLEY.—In answer to Dr. Swain's remark—he spoke of acute cases curing themselves spontaneously in many cases—I agree with him that many of these cases do cure themselves spontaneously, but I know that a large percentage of the chronic frontal sinusitis patients who come under our care are those who give a history of intense pain, supra-orbital neuralgia, for one, two or three weeks, the pain then disappearing and the discharge continuing to the time of observation. Some of the cases have been of such long standing the patients have no recollection of the origin. I believe that if most of their cases had been treated properly in the acute stage they would have been cured and not have become chronic.

In regard to the closure of the naso-frontal duct, I have kept a careful record of all cases of chronic sinusitis in which I was able to probe the frontal sinus. In most of the cases I tried the various

intra-nasal methods for curing the disease. I found most cases of chronic frontal sinusitis accompanied by ethmoiditis, the antrum also infected and the sphenoid not infrequently. If there were polypi present all were removed intra-nasally and the ethmoids curetted and opened with forceps, and then when that failed, as in a large percentage of cases it did, resort was made to the radical operation. Having been able to pass my probe into the naso-frontal duct before operation I knew how far it went, and then when the case was healed I attempted again to probe the duct. One can then seldom pass a probe up more than a quarter of an inch; it is impossible to go above the level of the inner canthus of the eye. Two cases in which I was able to do that during the process of healing came back for a second operation, so that I feel that unless the naso-frontal duct is closed we have probably left something in the way of ethmoidal cells or mucous membrane at the lower portion of the naso-frontal duct which is bound to secrete. That was the condition of these cases operated on a second time. In one, superiorly, there was also under a little shelf of bone not taken off an area of gelatinous polypi similar to those found at the first operation. That case had a fistula form and discharge for a week, then close up, and in three or four weeks break down and remain so for fourteen months, when the patient underwent a second operation and is to-day well.

I think in doing this operation certain things are necessary. In the first place, it is necessary to absolutely remove every vestige of the membrane lining, not only the frontal sinus, but the diseased ethmoidal cells, and the naso-frontal duct. I do not think it is possible to do this with the ordinary daylight illumination, but only with a brilliant electric light. One must be careful to search for those orbital recesses so frequently found. They go back over the orbit and I know of nothing so important as the removal of the membrane from these recesses.

Dr. Swain has asked what I have removed in operating. I removed at first three-quarters of the anterior wall, leaving a part of it overhanging, enough to get at all portions of the cavity. I later found that the removal of all the anterior wall gave less deformity and lessened the time of healing. The size of the sinuses varies considerably. I have found some unusually large ones.

The larger the cavity, the longer the time required (other things being equal) to obliterate it. In two cases in which I have operated a second time, where I had expected to find connective tissue, I found

bone. At first the connective tissue and periosteum are firmly bound down; later on they become freely movable.

I would like to speak about Dr. Bryan's remark. I feel where a case has been operated on twice, at least in my own cases that I have left something the first time which ought to have been removed.

In packing the wound I separate the edges widely. The outer part of my incision is united by two or three sutures, about an inch of the median portion is left unsewed, and the margins are separated by the gauze packed into the cavity.

DR. WILLIAM E. CASSELBERRY.—I have only an additional word to say. I did not understand that the discussion was to embrace acute sinusitis, consequently I said nothing in the paper with respect to the acute form of frontal sinusitis. I agree that nearly all acute cases recover spontaneously, leaving only a small percentage to require radical operation. As I understand it, Dr. Coakley was assigned to consider frontal sinusitis from the radical operative standpoint, and I from the conservative standpoint, and I have been pleased to see how close together we came with regard to the treatment. I am in harmony with him as regards the main indications for and the method of external surgical operation, and from what he says of the intra-nasal conservative methods I feel that he gives them also a fair field in his practice.

DR. JOHN O. ROE.—Those who have participated in this discussion seem to have lost sight of the subject and have discussed only the radical measures to be adopted in the treatment of extreme cases. The external operation for frontal sinus disease has been mainly considered, while the less radical methods of treatment have received little or no attention. The ethmoid cells, also, have been almost entirely overlooked, and they I consider quite as important as any of the other cells we have to deal with, because they are almost always the ones first diseased, and from these the sphenoidal and other cells become infected.

It may be a pertinent question to consider, in connection with this discussion, what may be regarded conservative treatment and what radical. Formerly conservative treatment would have been considered the use of sprays or washes for syringing the cavity, and the local application of remedies where feasible or possible; while radical treatment included all surgical measures, such as opening the cells or cavity to give free drainage and the removal of polyps or other growths that may be found. At the present time,

the latter measures are considered quite conservative, while the radical ones consist not only in freely opening the diseased cavity by an external operation and the entire removal of the mucous or lining membrane, but in the complete obliteration of the cavity. Therefore, the measures regarded by one operator as conservative might be considered by another as quite radical, and *vice versa*.

There was one point mentioned by Dr. Coffin, that it is regarded necessary to remove the middle turbinate in order to get at the ethmoidal cells. This is a mistake, and I am very glad that Dr. Myles has also alluded to it. The middle turbinate is simply an appendix of the ethmoid bone and the ethmoidal cells can be freely opened without the removal of the middle turbinate at all. The bullae ethmoidals, the anterior and also the posterior ethmoidal cells can be very readily opened and removed from under or behind the middle turbinate without removing it.

In none of these cases do I regard the external operation necessary except, as I stated in my paper, when the ethmoid disease is complicated with an intractable disease of the frontal sinus. Therefore, in simple or uncomplicated disease of the ethmoid cells the external operation is unwarranted. I quite agree with Dr. Harris that the sphenoidal cavity is almost invariably infected by disease of the ethmoid cells. In dealing with the diseases of the sphenoidal cavity, therefore, it is of the utmost importance to remove the posterior ethmoid cells.

DR. T. PASSMORE BERENS.—In answer to Dr. Mayer's question, I understood him to ask me to describe the radical operation by way of the maxillary antrum. Owing to the time limit placed on the discussion, I must decline to describe it and refer him to *The Laryngoscope* of 1904. There is one point in the operation that he made particular reference to which I should like to take issue upon. We both saw the operation performed in Berlin, and considerable blood did enter the pharynx. This is prevented by the insertion of a post-nasal tampon, a procedure I always follow. An assistant takes care of the slight amount of blood coming through the mouth wound. In a case of sphenoid sinus disease, accompanied by ethmoid disease and disease of the antrum of Highmore, I believe that the sphenoid disease should be operated upon by way of the antrum of Highmore and the ethmoid cells. If the sphenoid disease is complicated or caused by an ethmoid disease, I believe if the nasal route is assessable we should use it. There are certain conditions that render this route impracticable; for instance, a very marked deflection of the septum, especially at its upper posterior end. I recently

saw a case in which the septum entirely occluded not only the ostium of the sphenoid, but went very far over into the pars-ethmoidalis of the sphenoid. In that case it would have been impossible to operate through the intra-nasal route. In such cases I think the operation should be by the antral route, even if the antrum is healthy, and especially if the sphenoid and ethmoid disease is causing constitutional symptoms.

The fact that deaths are reported as following operations on the accessory sinuses should lead us to be the more careful not only in our technique, but also in the selection of our cases for operation.

We must remember in operating in the ethmoid labyrinth that we are dealing with a cellular structure not unlike, in many respects, the cellular structure of the mastoid cells, and we should have as clean and smooth a wound in the one as in the other. An incomplete operation on the ethmoid cells is always followed by prolonged suppuration, while the surface secured by a complete operation heals very rapidly.

The Effects of Tonsillotomy—W. B. STEPHENS (San Francisco)—*Cal. State Med. Journ.*, Sacramento, March, 1905.

Stephens divides the effects of tonsillotomy into two groups: 1. "The immediate or those closely succeeding the operation, and which are for the most part transient. 2. The ultimate, which are more or less permanent. In the first group he considers hemorrhage, its sources and treatment, pain, edema, infection, asphyxia and shock. But it is the ultimate effects which he presents most instructively and interestingly.

" * * * The amount of damage which may be inflicted upon the throat by unskilled hands; in what is ordinarily termed 'so simple an operation' is astounding." He cites certain conditions in which special experience is needed, and remarks: "I would ask the general surgeon to at least be discriminating in the tonsils he attempts to remove. All damage inflicted at this operation is not to be laid at the door of the general surgeon. The specialist is not infallible." Stephens' experience speaks for a thorough removal; most frequently he does an enucleation, claiming that the removal of only a portion of the tonsil of a child of lymphatic temperament, in the majority of cases does not give complete relief. In a few instances he has seen the reproduction of a tonsil fully as large as half a walnut from a small bit of tissue left in the superior fornix between the pillars of the fauces.

EATON.

NEW OPERATION AND INSTRUMENTS FOR DRAINING THE FRONTAL SINUS.*

BY E. FLETCHER INGALS, M.D., CHICAGO, ILL.

Acute suppurative inflammation of the frontal sinus generally heals without operation on the sinus provided obstructions to the escape of the pus from the lower end of the canalis naso-frontalis are removed and I believe that in the majority of cases chronic supuration of this cavity would soon cease under simple measures if there was free drainage. At all events free drainage is necessary in every case whether or not curetting of the cavity is required, and the more easily this can be secured, the better. In my experience most patients refuse to have an external operation performed, probably on account of their dread of the resulting scar, and they can only be driven to it by intolerable pain or by external deformity due to the disease.

In nearly all cases, a probe may be passed from the naris into the frontal sinus after the anterior portion of the middle turbinated body and any pathological obstructions have been removed. Whatever operation is to be performed, all these obstructing conditions should first be eliminated, therefore, very few cases remain in which a simple and safe intra-nasal operation that will establish free drainage is not eminently desirable.

I desire to present such an operation for your consideration without taking time to refer to any of the other well known operations. In a word my operation consists of passing a steel pilot through the natural canal into the frontal sinus and running in over this a hollow burr by which a canal 6 m.m. in diameter is made, and then inserting into this canal a self retaining gold tube so large that the pus will necessarily drain and that the patient may easily wash out the sinus.

In performing the operation, I first introduce a small silver canula and wash out the frontal sinus with a 50% solution of the commercial solution of peroxide of hydrogen, warm; I immediately follow this with a warm saturated solution of boric acid. I then inject into the sinus slowly, five to ten minims of the following solution which trickles down about the canula and anaesthetizes the field of operation. Atropin gr. 1/10th, Strophanthin gr. 1/5th, Suprarenalin,

* Presented to the American Laryngological, Rhinological and Otolological Society, Boston, June, 1905.

gr. 1/5, Oleum Caryophylli m.iii, Acid Carbolica gr. X, Cocaine Hydrochlorate gr. xvi, Aqua. Dist. ad. f oz. i. I then introduce the steel pilot Fig. I, A, which is no larger than an ordinary probe, and with the patient in the sitting position, administer chloride of ethyl for a minute or two, which insures complete anæsthesia. The handle is removed from the pilot and the hollow burr Fig. I, B, (which has already had a flexible sheath. Fig. I, C slipped over it and been attached to the chuck of a dental engine) is slipped over this pilot into the naris and up to the lower end of the naso-frontal canal. Gentle continuous pressure is then made, the electric current is turned on and within a few seconds the frontal sinus has been entered. In some operations I have used the chloride of ethyl and in others have relied on local anæsthesia, which appears to be sufficient. Before turning on the power one should note just how much of the proximal end of the burr protrudes from the nostril, otherwise he will not realize when it has passed into the sinus and he may waste a lot of time (as I did in one operation) in the impossible effort to



Fig. I. Ingals' Pilot Burr; two-third size. A, pilot; B, burr; C, shield.

make it go farther. One can not recognize the drilling of the bone by either the sound or the feeling of the instrument. As soon as the sinus has been entered the burr is withdrawn and a packer, (similar to a uterine packer) the end of which has been bent to the same curve as the pilot, is introduced and through it the frontal sinus is packed and dried by a strip of absorbent gauze an inch in width which is left long enough to stop any bleeding. The gauze is then withdrawn and a similar strip saturated with 95% of carbolic acid or with 10-20% solution of chloride of zinc is introduced in the same way and allowed to remain a few minutes. The packer is then withdrawn about an inch to insure thorough cauterization of the whole canal, and the strip is then drawn out, through the packer, so as to avoid cauterizing other parts of the nasal cavity. The gold tube, Fig. II, (the upper end of which has been sprung together and covered with a gelatine capsule) is then slipped on an applicator and passed up the canal until stopped by its lower flaring end. A probe is now pressed up against the end of the tube and the applicator is withdrawn. For recent operations I have used the shield C, Fig. I,

which has been made a spiral tube throughout its whole length, to put over the applicator as a check to prevent the gold tube from slipping too far on it. When the gold tube has been placed in the canal it is crowded off the applicator, as the latter is withdrawn, by pushing the spiral tube upward. Within half a minute the gelatine capsule will dissolve and the end of the tube will have opened out so that it will be retained. The operation is then complete. I give the patient a small syringe with a bent nozzle, Fig. III, by which the frontal sinus can be washed out or medicated. Little or no attention by the surgeon will be needed afterward. The instruments consist of a flexible steel pilot, Fig. I, A, $14\frac{1}{2}$ c.m. long and 1 to $1\frac{1}{2}$ m.m. in diameter which will project 5 to 10 m.m. beyond the hollow burr when the latter has been passed up to the farthest extent. This absolutely prevents perforating the top wall of the sinus.



Fig. II. Ingals' Spring-gold frontal sinus drainage tube. The upper tube in the cut shows the upper end opened out. The small cut at the right shows the lower end of the tube. The small cuts at the left show the diameter of the tube and the gelatine capsule. The lower tube shows the tube with the upper end sprung into the capsule.

A removable handle for the pilot to facilitate its introduction. A hollow burr, Fig. I, permanently fixed to the end of a hollow steel wire cable, 6 c.m. in length which is permanently fixed to a steel tube (like a trephine) the other end of which terminates in a shank for attachment to the dental engine chuck. At the proximal end of this tubular portion where it terminates in the shank, is a small opening in its side to facilitate cleaning. The cutting burr is 6 m.m. long and $6\frac{1}{2}$ m.m. in diameter and is so made that it will feed rapidly and cut any bone with which it comes in contact. The burr might be made larger without much danger of doing harm, but I believe its present size is within the limits of perfect safety and in the light of experience, I can see no reason for a larger drainage canal than this affords. The whole instrument, which I have named pilot-burr, is 19 c.m. in length. It will be observed that the distal end of the pilot is necessarily kept in position by the canal into which it is inserted so that the whole apparatus can not revolve when the burr

is turning, and the proximal end is held by the tubular end of the burr so that the operator has the instrument under control. The thin spiral steel sheath for the cable and tubular portion of the burr, Fig. I, C, prevents any injury to the nasal passages due to rapid turning of the instrument. This is flexible so that it may follow any curve that is given to the pilot. A dental engine, rated 1/8th h.p. furnishes the most convenient power though an apparatus to operate the burr by hand might be made. The packer, Fig. IV, is a thin tube the external diameter of which is a trifle less than that of the burr. It is bent to the same curve as the pilot and is very easily introduced through the enlarged canal into the frontal sinus. From the examination of the frontal sinus in cadavers upon which I did the operation, I found that the opening through the mucous membrane lining the frontal sinus was not clear cut, and was apparently much smaller than the burr, therefore I had a ring knife made on a



Fig. III. Syringe for Washing Frontal Sinus; two-third size.

flexible steel stem wherewith to curette the borders of the ostium frontale; this worked satisfactorily, but since perfecting the drainage tube, I find it unnecessary. The self retaining gold tube, Fig. II, is $3\frac{1}{2}$ c.m. long and 6 m.m. in diameter. It is made of spring gold. The lower end has an oval cup-like flange 12 m.m. long by 6 m.m. wide. From the upper end the tube is sawed down 2 c.m. in 6 places making six sections, nearly a m.m. of the end of each of which is bent inward at a right angle so as to make the end blunt. About 12 m.m. below this upper end I bend out each of these sections so as to make the upper end funnel shaped and about 9 m.m. across at the end, which makes the tube self retaining. The slits down the side make each of these sections a nearly flat spring about 2 m.m. wide and 2 c.m. long and renders it easy to withdraw the tube at any time the surgeon may wish. The slits also prevent pocketing of pus about the tube in the lower part of the sinus. The part of a gelatine capsule used to hold these six spring sections together when intro-

ducing the tube is a trifle smaller than the normal size of the drainage tube. The applicator is a bent copper wire over which I pass the spiral shield thus forming a shoulder to prevent it from slipping too far into the gold tube, and providing a means of pushing the latter off of the applicator. The syringe that I furnish the patient, Fig. III, consists of a small rubber bulb holding two to four drachms fitted with a hard rubber tube $3\frac{1}{2}$ m.m. in diameter and 7 to 8 c.m. long. This was made of an antitoxine bulb, the vent of which had been closed and a tube taken from an old atomizer. A Eustachian catheter might be bent for this purpose.

Beaman Douglas in *THE LARYNGOSCOPE* for May, 1904, p. 346, gave five objections to intra-nasal operations for opening the frontal sinus.

1. Absence of the frontal sinus.
2. Thinness of the posterior (or upper) wall of the sinus.
3. Liability of entering an enlarged ethmoid cell instead of the frontal sinus.



Fig. IV. Frontal Sinus Packer; one-third size.

4. Variation in direction of naso-frontal duct.
5. Danger of opening into the olfactory fissure and injuring the nasal artery and nerve, and of opening a direct line of communication with the brain, with the possibility of injuring the brain, or of septic meningitis.

The first and fourth of these objections have no bearing on the operation that I propose.

Regarding the second—because of the protrusion of the end of the pilot, it is impossible to perforate the posterior wall of the sinus in this operation, excepting by a lateral grinding action of the burr in an extremely narrow sinus, where the dural surface of this wall would be less than 3 m.m. distant from the center of the naso-frontal duct—a condition that if ever present, would be extremely rare. If such a condition were met with, I do not think the dura could be cut by the burr.

Regarding the third objection—If an ethmoid cell is suppurating, it should be drained, therefore no harm would be done by this operation.

Fifth, As to the danger from the olfactory fissure—the objection urged applies with even greater force to external operations that establish a drainage canal large enough to be permanent, and injury of either the artery or nerve would be of no serious moment. The danger of infection must be met in any case and should be minimized in every possible way, but this danger is no greater with this than with other operations.

In conclusion, the advantages presented by this operation as they appear to me are:

1. It causes no scar, it affords efficient drainage and it enables the patient himself easily to cleanse the sinus.
2. It is much safer than other intra-nasal methods.
3. It can be done early before permanent pathologic changes have taken place and in such cases it may be expected to effect a cure.
4. The early establishment of free drainage usually prevents serious pathologic changes.
5. It is no bar to a later external operation if that should become necessary; indeed, by taking the place of a part of that operation it renders it much less formidable.

I have done the operation several times with good results and in no case has anything unfavorable occurred; therefore, I can heartily recommend it in practically all cases of suppuration of the frontal sinus in which a probe can be passed from the naris into this cavity.

34 Washington St.

Some New Instruments—URBANTSCHITSCH—*Monatschr. f. Ohrenh.*, Berlin, Jan., 1905.

The author describes an attic irrigator which is not new, an instrument for intra-nasal measurements called a "Distanzometer," and an end-piece for the vibrator, which is saddle-shaped, to fit over the bridge of the nose. He uses the latter in cases of coryza, and claims that its use gives the patients considerable relief.

YANKAUER.

SYMPOSIUM: Syphilitic Manifestations in the Upper Air Passages.*

**American Laryngological, Rhinological and Otological Association.—
Boston Meeting.**

Syphilis of the Nose and Accessory Sinuses.

By JAMES E. LOGAN, M.D., Kansas City, Mo.

Syphilis of the Nasopharynx, Ear and Buccal Cavity.

By J. A. STUCKY, M.D., Lexington, Ky.

Syphilis of the Larynx and Trachea.

By FRANCIS R. PACKARD, M.D., Philadelphia, Pa.

SYPHILIS OF THE NOSE AND ACCESSORY SINUSES.*

BY JAMES E. LOGAN, M.D., KANSAS CITY, MO.

No subject in medical literature has been more thoroughly studied or more exhaustively written upon than Syphilis, and yet when we compare our knowledge of this, with that of many other diseases we find astonishing deficiencies. In diagnosis, symptomatology and treatment we are wonderfully proficient, while in pathology we are seriously lacking. It would require much more time than is allotted this paper, to discuss the pathology of general syphilis, though it would afford interesting reading. No greater honor has ever been accorded a man in our noble profession than will be given to him, who discovers the true original etiological factor in this most dreaded malady, and no one will ever render a greater service to mankind.

Primary nasal syphilis is of rare occurrence, and we wonder that more cases are not reported, when we consider the uncleanly habits of the class of people in which this disease mostly abounds.

Buckley, from an analysis of 9058 cases of extra-genital syphilis found 95 primary lesions in the nose—he personally found one case in 113 reported. In 2244 cases observed by Bassereau, Clerq, Lefort, Fournier and Ricord, primary nasal lesions were found in two. In 292 cases of extra-genital reported by Fournier and Martineau, not a single one exhibited a primary sore in the nose.

The favorite site for the nasal chancre is upon the cartilaginous septum, which is probably due to the fact that in this locality there is often an abrasion of the mucous membrane. Some have been found

* Read at the Eleventh Annual Meeting of the American Laryngological, Rhinological and Otological Society, held at Boston, June 5 to 7, 1905.

on the under surface of the alæ, and a few have been observed higher up in the vestibule. The finger nail seems to have been the most frequent means of conveying the infection—infected instruments have been regarded as the offending agents in some instances.

The initial nasal lesion does not differ essentially in character from that found elsewhere. Diagnosis may at times be difficult. Before the breaking down of the papule, which may require several days, the condition may be readily mistaken for an ordinary *furuncle*. The principle factors in determining this are the question of *time*, together with the amount of lymphatic involvement. Forty-eight to sixty hours will usually conclude the formative stage of a furuncle, while the chancre will be slow—sometimes requiring a week or more to develop.

The furuncular process invades the surrounding lymphatics but slightly, while the chancre will extend to glands not only close by, but to those situated some distance from the seat of infection—such as the submaxillary, the sublingual and even to the post-auricular and cervical regions. The furuncle is usually located in and about the hair follicles, while the chancre is most often found upon the septum or upon the membrane lining the vestibule or turbinates.

The chancre may be confounded with the *tubercle*.

Nasal tuberculosis is very rare indeed and the writer is not aware of a case reported as one of primary invasion.

The symptoms of pulmonary involvement are nearly always present, and if any doubt exists the microscope will easily determine the presence of the tuberculous bacillus.

It may be difficult at times to differentiate between a chancre and some form of malignant disease—such as carcinoma or sarcoma.

The symptomatology of malignancy usually points to pain—repeated hemorrhage and slow development without febrile manifestations:—whereas the chancre seldom causes pain—rarely bleeds and often exhibits temperature changes. The microscope will again offer a sure solution of the difficulty.

The *Secondary* stage of nasal syphilis is hard to recognize, due to the fact that but few and very indefinite symptoms are manifest during this period of the disease. But few patients fail to suffer from the so-called "Secondary Coryza," though not many would be willing to venture a diagnosis based upon this fact alone, or indeed upon any nasal symptoms liable to be observed during this time.

Intuition is often treacherous, but many times have we all seen cases of Coryza with reddened alæ—watery acrid discharge and said to ourselves that we had a Specific Condition—there is that "un-

seen something" that tells us this, but it would be most unwise to give heed to this impulse without a careful survey of every symptom. Happily our resources are many and we resort to them for further confirmation. It is at this time that Syphilides of distinctive characteristics, general lymphatic involvement—mucous patches in the mouth, and the like, are present, serving to strengthen the evidences found in the nose.

It has been noted by some writers that in those cases where secondary nasal symptoms are distinctly evident there often coexists palmar psoriasis a manifestation of some rarity in the earlier stages. The writer has especially noticed this in one case.

TERTIARY PERIOD.

This is the particularly interesting stage of nasal syphilis. The writer has often ventured the statement before his medical students that the nose will more frequently and more delicately reflect the presence of a specific infection of long standing than any other organ in the body. This is rather easy of explanation when we consider that the nasal bones are most fragile as well as being richly endowed with blood, and it would be very natural that such a process, however slight, might invade these delicate structures. Notwithstanding the fact that this susceptibility exists, we seldom see tertiary manifestations in the nose till late in the history of the disease. Those cases that have undergone spasmodic treatment seem especially liable to nasal complications—such, for instance, that go to the various hot springs throughout the country and pass through the secondary stages with comparative rapidity.

In married women whose husbands have transmitted the infection, and where the attending physician has been over-cautious in keeping secret the real condition for fear of possible scandal, one will notice the remarkable prevalence of nasal involvement. The writer could report many such cases.

The lesions of this stage are extensive and oftentimes very destructive. But few diseases offer symptoms with which these might be confounded—lupus, tubercular necrosis and malignant neoplasms might present some difficulties in diagnosis. Lupus is distinctly a skin disease and such evidences are usually present. Tuberculous pulmonary symptoms will rarely fail to clear this obstacle, while malignancy can almost always be excluded by the ever present symptoms of pain. The microscope will give valuable aid.

PATHOLOGY.

The submucosa, which serves as the periosteum of the bone, is primarily affected, followed by diffuse inflammatory processes developing in the bony framework.

Differing from some authorities upon this point the writer believes that the bony structures are affected before changes in the mucous membrane are noticeable. The breaking down of the membrane is due to the cutting off of the circulation by pressure on the blood channels, rather than to inflammatory infiltration into the connective tissue. The gummatous nodule develops in the space between the periosteum or perichondrium and the bone or cartilage primarily, and not in the mucous membrane. Pressure due to this focus of inflammatory deposit produces necrosis of the bone or cartilage. A gummatous node undisturbed by pressure, such as we find in the brain, lungs, larynx, etc., grows to large proportions and sooner or later undergoes fatty degeneration. Histologically these tumors consist of small round cells surrounded by giant cells. Some of these cells reveal the presence of the *Lustgarten bacillus*. The adjacent tissues show inflammatory proliferation and the walls of the blood vessels are hyperplastic. Any part of the bony framework may be attacked by this disease, but the vomer and perpendicular plate of the ethmoid are especially predisposed to incipient necrosis. In the experience of the writer a large majority of cases have exhibited this fact.

The next in point of frequency are the turbinates—the inferior being usually first to give evidence. The membrane covering these bodies presents a blanched expression, such as we find in a vasomotor coryza, discharging a purulent secretion. The tissues are highly congested with venous blood due to stasis from underlying pressure. This engorgement is more or less permanent, that is to say, it does not disappear until the bony structure gives way and necrosis takes place. If the septal conditions are not checked the floor of the nose will surely become involved and extensive destruction of the hard palate takes place. The nasal bones together with the nasal processes of the superior maxillary are likewise very early affected, a condition, which if allowed to progress, results in the characteristic “saddle nose.”

It is hardly necessary to enter into any detailed account of the conditions resulting from this disease. Every thing depends upon the time at which we see the case, the general condition of the patient and the willingness of the individual to carry out a vigorous course of treatment.

ACCESSORY SINUSES.

Primary infection of the sinuses adjacent to the nose is hardly likely to occur. We fail to find mention of such condition unless the orbit be considered accessory.

The same may be said of the secondary period excepting the coryzal symptoms manifest also in the nose. Tertiary bones necrosis is very common. The fragile walls and tell partitions are very surely involved if the disease is allowed to progress. The frontal and ethmoidal are the first to be invaded and later the sphenoidal body.

A very interesting case has lately come under the observation of the writer which will serve to verify the statement previously made that the nose was a fertile field for reflecting a latent infection, exhibiting also a sphenoidal sinus complication without involvement of the frontal or ethmoidal bodies.

H., age 64 years—surgeon—was infected upon the finger two years ago while operating.

Treatment during secondary period consisted of injections of gray oil and inunctions of mercurial ointment covering a space of eighteen months—symptoms disappeared and patient considered himself free from danger. Six months later he applied to me for treatment of his nose—complaining of soreness and pain located about the septum, and closure of the right nostril causing difficult breathing—examination showed a small ulcer located at the junction of the cartilaginous and bony septum. Treatment was applied locally and the patient urged to take iodide of potash to full effect and continue same indefinitely. Imbued with the true surgeon's spirit he proceeded to take this drug without regard to size of dose or stomachic endurance.

In due time the nasal symptoms disappeared and very shortly thereafter the stomach refused to serve its purpose. He discontinued his medicine. Ten weeks ago patient suffered what was supposed to be an attack of la grippe—complained of violent post occipital pains—had little or no temperature—lost flesh rapidly—grew steadily weaker. I was called in to examine him and soon discovered a large necrozing ulcer at the juncture of the basilar process with the sphenoid—extending down the posterior border of the septum and invading the nasal surface of the soft palate.

HEREDITARY SYPHILIS.

A very interesting question regarding the "Infecting Period" of the parent has been discussed at great length by Syphilographers, and it is a matter of the greatest importance to the surgeon.

Many times we are asked when is marriage permissible. Without going into detail upon this phase of the subject—you will pardon the digression of the writer when he says that never should a surgeon encourage such a step until every possible chance of infection has disappeared. Three years under the most favorable condition is none too soon. At least a year should elapse after every symptom of the disease has vanished.

Most syphilitic children are born into the world with secondary symptoms. The skin manifestations are most prominent and are usually unmistakable—mucous membrane especially of the mouth and nose are nearly always affected at birth or soon after. The secondary Coryza or “snuffles” is usually present, together with mucous patches of the pharynx and mouth.

Children born of this misfortune often present a characteristic physiognomy. The flattened bridge, the illy developed alæ, the sunken face all go to make up a diagnosis which is beyond question.

The tertiary conditions in patients of hereditary infection are similar to those found in the acquired type.

Upon the question of treatment, the writer desires to offer a few suggestions.

First—Waste no time in preparing a patient's general condition to be followed later by specific medication. Tertiary destruction is too rapid to admit of any delay.

General anæmia, a disordered digestive apparatus, in fact all disturbed functions will respond under proper attention devoted to the dominant malady. No medication directed to the relief of a patient's general health will avail any thing when a specific infection is destroying the physiological function of every organ in the body.

Second—Iodide of potash is the great potential agent in the hands of the physician. A careful study of the physiological effect of this drug must be made upon each patient. It is seldom that any two individuals can be treated alike.

Third—Never push the drug to its full physiological effect—that is, to the point of producing a catarrhal condition of the nasal mucous membrane and conjunctiva—nor to a point where the stomach will refuse to act. This can usually be avoided by giving it in gradually increasing doses. The method invariably employed by me is to begin with ten grain doses to an adult one hour after each meal, increasing one grain to each dose every other day. I employ an aqueous solution in which one drop represents one grain. The time at which the medicine is taken is a most important point. Any

sooner than an hour after meals will surely bring the stomach to an early refusal of the drug. The best results are not obtainable by giving the dose an hour or less before meals.

A catarrhal condition of the stomach will likely result from this method.

You will pardon the writer for indulging in this rehash of treatment, but it is surely a fact that failure in these cases is attributable more to the mismanagement of our therapeutic agent than to its inefficiency.

1208 Wyandotte St.

The Tonsils as Portals of Infection—M. W. FREDRICK (San Francisco)—*Calif. State Med. Journ.*, Sacramento, Feb., 1905.

Following the paper of Dr. Frederick A. Packard, of Philadelphia, read in 1899, Frederick gives a valuable résumé of the present knowledge of the tonsils as portals of toxemia, both by bacteria and their toxins. By "tonsils" he means the whole of Waldeyer's lymphoid ring.

The only really good function of the tonsils, he thinks, is the elaboration of a small amount of young leukocytes, and the effect of these is quite overbalanced by the constantly recognized constitutional conditions caused by the absorbed toxins.

In May, 1899, Packard reported five cases of endocarditis following acute angina, in three of which the heart was known to be sound before the angina, and stated that he had been astonished at the frequency of attacks of endocarditis without rheumatism which gave a history of one or more attacks of acute and severe sore throat.

Other conditions of tonsillar origin are: pleuritis, chorea, rheumatism, etc., and Frederick is inclined to look upon the peculiar formation of the tonsillar tissue as the thing inherited, rather than rheumatism and the other diseases referred to.

He refers also to the chronic toxemia which exists in those persons who have certain chronic conditions of the tonsillar ring.

EATON.

SYPHILITIC MANIFESTATIONS IN NASO-PHARYNX, EAR AND BUCCAL CAVITY.*

BY J. A. STUCKY, M.D., LEXINGTON, KY.

I regret very much that I have nothing new to offer in this symposium. Little advance has been made in methods of diagnosis, and little that is new, tried and true, is offered in way of shortening the time of treatment. It is gratifying to know that when recognized, we feel assured beyond a reasonable doubt that our science offers practically a specific for the thorough eradication and elimination of the disease, if the afflicted is willing to be patient and persevering in the treatment. We are firm in our belief that the disease can be accurately diagnosed, though it may take a few days', or weeks' observation in some cases to establish the fact, also that the disease can be cured without reasonable doubt, failures, of which there are so many, being due not to the physician, but to carelessness and neglect on part of the patient.

It is not my purpose to occupy valuable time in attempting a text book method in the part of the symposium allotted to me. This can be obtained in much better form from the many invaluable Text Books which are now so easily within reach. I shall not attempt a minute and detailed description of the essential features of the disease, but rather I shall seek to emphasize certain points observed in my personal work.

Syphilitic manifestations in the Naso-pharynx, Ear and Buccal Cavities, are nearly always of the secondary or tertiary form. I do not recall having met a single instance of primary infection, the chancre, in these localities. Unfortunately, the microscope or laboratory tests and examinations offer us but little aid, the peculiar and important organism never having been discovered. In the naso-pharynx, it is the mucous patch or ulceration that causes the discomfort that brings the patient to us for examination and treatment of what is usually supposed to be a simple sore throat. In many cases consulting us, we can obtain no history of the primary lesion, and I have learned not to rely so much upon the history given as upon what is seen in the patient.

* Read at the Eleventh Annual Meeting of the American Laryngological, Rhinological and Otological Society, held at Boston, June 5 to 7, 1905.

We have been taught "to look upon every true ulceration of the mucous membrane as either syphilitic or tubercular," and it is seldom that I have found that teaching misleading; indeed so seldom, that I have been inclined to test the accuracy of my own observations and deductions rather than that of the teaching.

I am convinced that tubercular lesions of the naso-pharynx and fauces are so rare that they may be almost regarded as the exception to the rule. However I make it a rule to use every known method to eliminate the one or the other before giving an opinion or beginning the treatment. In the case of the tubercular, we have as a rule other symptoms of septic systemic infection, and we can bring to our aid the thermometer, stethoscope, and microscope; but in the syphilitic, these are of little value to us. The ulcerations in both diseases look so nearly alike, that without considering means other than ocular inspection, I question my ability to decide which is which. I have examined cases side by side, each pronounced in characteristics, one syphilitic and the other tubercular, with very little difference in general appearance, except that the tubercular ulceration existed upon an anemic relaxed membrane, with evidence of general toxemia. The microscopic examination of sputum and the stethoscopic examination of lungs made the distinction in diagnosis.

The distinction mentioned by Kyle and others that "the syphilitic ulceration has a fairly smooth floor and sides, and is not rough and shaggy and not very deep, as in the tubercular ulcer," I have not been able to define. My observation confirms that of many others, that the liquifying necrosis is more rapid in syphilis than in tuberculosis, and in the tertiary form of syphilis, the area surrounding the lesion is of a reddish or purplish red color. I have met both the secondary and tertiary form in all ages from four years to sixty years. The youngest case of secondary manifestation, the mucous patch, was in a boy thirteen years of age, the youngest manifestation of the tertiary form was in a child five years old.

Deafness and dysphagia are the symptoms most frequently complained of in the cases of secondary and tertiary syphilis of the naso-pharynx that have come under my observation, and as a rule they have yielded readily to Mercury and Sodium Iodide, given in daily increasing doses until the system was saturated with the drug and then continued for several years in tonic doses. The chief point in the treatment being to saturate the system as rapidly as possible, carefully looking after

the eliminative action of the alimentary canal, kidneys and skin. The mercury is given by both mouth and inunction and the Iodide of Soda largely diluted with water. The mixed treatment is used in every case where the naso-pharynx and fauces are involved, because it is more rapid, and arrests the destructive process of ulceration quicker and thus lessens the amount of cicatricial tissue and number of adhesions.

It must be borne in mind that the first evidence of the disease met in the naso-pharynx is not always the mucous patch or ulceration, but that gumma on the posterior wall and vault of pharynx are sometimes seen before they break down into the state of ulceration. When these mounds are revealed by posterior rhinoscopy they should, in the absence of syphilitic history, be looked upon with suspicion and watched carefully for confirmatory evidence of their true nature.

In the cases of syphilis of the Ear that I have met, the diagnosis has been made more by exclusion of other causes, by inference, and because anti-syphilitic treatment gave the best results. In several cases of middle ear and labyrinthine disease, in which no syphilitic history could be obtained and in which no external evidence of the disease existed and after all other means failed to make any impression or produce any improvement, a thorough course of Mercury and Iodine gave most gratifying results.

Syphilitic manifestations in the buccal cavity are seen more frequently in the secondary stage in form of mucous patches on the palate, anterior pillar of fauces, sides of tongue and lips. The primary form of the disease is sometimes met with in cancre of the lip, and I have seen one case, in the practice of a colleague, of typical chancre of the tip of tongue.

The general systemic treatment is the same, it matters not what portion of the naso-pharynx, ear or buccal cavity is involved. The local treatment consists in keeping parts thoroughly clean and making a topical application to the lesion to relieve pain. For the first, some preparation containing Hydrogen Dioxide with formaline, 25 per cent of each in water, to be used frequently as a wash: for the second, nothing has given the relief and apparently held in check the extension of the ulceration as well as chromic acid in 10 or 20 per cent solution, carefully applied to every part of the ulceration with a cotton covered probe. Before applying the acid, the parts should be thoroughly cleaned and dried.

SYPHILITIC MANIFESTATIONS IN THE LARYNX AND TRACHEA.*

BY FRANCIS R. PACKARD, M.D., PHILADELPHIA, PA.

As one would naturally expect, the manifestations of syphilis in the larynx and trachea are almost entirely confined to those of the secondary and tertiary periods of the disease. In fact, Bosworth,¹ states that he knows of but a single case of chancre of the larynx reported in the entire literature. This was reported by Moure². The sore occurred in a young man, 22 years old. It made its appearance on the free border of the epiglottis. It was followed by the development of secondary symptoms. Secondary syphilitic manifestations in the larynx are not uncommon, and broadly speaking may be classed as (a) syphilitic laryngitis, and (b) the mucous patch.

Syphilitic laryngitis is a very frequent manifestation of secondary syphilis. It may occur as the result of an extension downwards of a syphilitic pharyngitis; but it is probably more often entirely independent of any lesion of the neighboring tissues, and is a local manifestation of the general infection. The most prominent symptom is the characteristic raucous tone which the voice assumes. As Lennox Browne³ says, "When once appreciated, the raucous syphilitic voice is so distinct that the practiced ear will recognize the disease as soon as the patient speaks." The patient, as a rule, complains of no pain or local discomfort. On laryngoscopic examination, the appearance presented is very characteristic. There is a marked erythema, somewhat mottled in appearance, especially affecting the vocal cords. The discoloration is much less vivid than that seen in ordinary acute congestion of the larynx. It is dark red bordering on a purple.

Mucous patches when they occur in the larynx are usually found on the epiglottis or the vocal cords. The chief evidence of their presence is due to their interference mechanically with phonation. Their appearance when viewed with the laryngoscopic mirror is the same as that of mucous patches elsewhere. They form small discrete, elevated, greyish patches, generally sharply circumscribed with well defined edges.

* Read at the Eleventh Annual Meeting of the American Laryngological, Rhinological and Otological Society, held at Boston, June 5 to 7, 1905.

¹ Diseases of the Nose and Throat, vol. ii, p. 383.

² Leçons sur les Maladies du Larynx, Paris, 1890, p. 229

³ Diseases of the Throat and Nose, p. 382.

Midway between the lesions of secondary syphilis, the erythematous laryngitis, and mucous patch, and the lesions of tertiary syphilis, the gumma with deep ulceration, we find the so-called "superficial ulcer," or as Whistler termed it, "relapsing ulcerative laryngitis." This is a local ulcerative process which extends more deeply into the tissues than does the mucous patch, but does not show the extensive ulceration which accompanies a gumma. Whistler bestowed the name "relapsing ulcerative laryngitis" upon it because of its tendency to frequent outbursts of activity following upon periods of quiescence.

By far the most common manifestation of syphilis in the larynx is that of the tertiary period of the disease, the gumma and the ulcerative lesions and cicatricial contractions which follow in its train. Gumma of the larynx is generally of very late development, many years after the appearance of the initial sore. Its most usual location is the epiglottis, although the vocal cords are very frequently its site. It usually appears with considerable suddenness, giving rise to a good deal of pain and interference with phonation. Examination of the larynx shows the gumma as a smooth, rounded tumor. Laryngeal gummata generally begin to ulcerate and break down within a remarkably short time after they form, consequently the characteristic true gummatous appearance is rarely seen. When a gumma does break down it forms what is most generally known as the deep syphilitic ulcer of the larynx. The frightful results of this ulceration are unfortunately probably only too familiar to all laryngologists. The tissues seem to literally melt away. As the ulceration is usually at first not attended by much pain, or alteration of function, it often progresses to a terrible extent before it is recognized. A patient will present himself with the history that for some weeks or months he has had some pain and slight impairment of phonation, accompanied by profuse mucopurulent expectoration, often containing streaks of blood. Examination reveals an ulcerative process possibly involving the entire epiglottis, or even a large part of the vocal cords. Cases have been recorded in which extensive oedema of the larynx accompanied the ulceration, requiring in some instances the performance of tracheotomy for relief.

Probably the most familiar picture presented to laryngologists in syphilis of the larynx is that made up of the adhesions, contractions, and distortions resulting from the cicatrization of deep syphilitic ulceration. The destruction may involve the entire epiglottis or the vocal cords, or we may find those strictures existing but twisted and contorted by strong cicatricial tissue, or the true or false cords may

be adherent to one another in such a way as to leave nothing but the merest chink for the passage of the air. In all the reparative processes of syphilis it is characteristic to find the formation of strong adhesions, such as those which follow on a larger scale after severe burns. These will sometimes twist the laryngeal structures in such a way as to render it impossible to definitely locate the site of the strictures of that organ. There is also such submucous thickening and infiltration of the larynx following syphilitic ulceration that it is frequently necessary in these cases to perform tracheotomy because of the encroachment on the lumen of the larynx.

Syphilis of the trachea must be regarded as very rare. Lewis A. Conner⁴ in a paper on "Syphilis of the Trachea and Bronchi," states that Morell Mackenzie had seen mucous patches in the trachea only five times, and that no case of the initial lesion of syphilis occurring in the trachea has been recorded. Conner in this paper reported one case of syphilitic stenosis of the bronchi and analysed 128 recorded cases of syphilis of the trachea and bronchi. Although he considers such cases as very rare, he justly remarks that they bear an importance quite out of relation with their great rarity because "first, in almost every recorded case they have gravely threatened life, and in most cases have actually caused death; and, second, from a study of the cases, it seems quite evident that a very large proportion of them are curable if they can but be recognized and treated early." As a rule, cases of tracheal syphilis do not fall into the hands of the laryngologist. From Dr. Conner's analysis, it would appear that they are very seldom diagnosed *intra vitam*, and even so their treatment is generally carried out by the internist unless the dyspnoea becomes so urgent as to demand tracheotomy.

The treatment of syphilis of the larynx and trachea is of course first and foremost the specific measures appropriate to the treatment of the lesions of secondary and tertiary syphilis wherever found. It is generally wise, however, to push the mixed treatment hard. Mercury and potassium iodide in large doses will sometimes avert a threatening extensive destruction of laryngeal tissue, or melt away gumma in a marvelous manner. Locally soothing and cleansing sprays and inhalations will add to the comfort of the patient. The mucous patch will often disappear more rapidly if touched occasionally with a strong solution of silver nitrate, (3i to f3i). For ulcerations, whether superficial or deep, insufflations of iodoform will be found beneficial. Here again applications of strong solutions of nitrate of silver, or of some of the various preparations of silver in

⁴ *Am. Journ. Med. Sc. Phila.*, July, 1907

egg albumen with which our wholesale drug firms love to flood us, will be found of service. Most authorities agree in stating that the stenosis of the larynx in tertiary syphilis is not due to an infiltration, but to cicatricial contraction, and inflammatory adhesion of the tissue, and accordingly constitutional treatment is of no avail. Bosworth is particularly cautious concerning the use of potassium iodide which he believes when used under these circumstances frequently excites an iodic laryngitis. For the removal of the stricture of the larynx, innumerable instruments and operations have been devised. They all aim at permanently enlarging the opening through the strictured portion of the larynx. There are many forms of dilators, bougies, and cutting dilators, but most of them fail in the great majority of cases to attain the object for which they are devised, the great obstacle to permanent success lying in the obstinacy with which syphilitic structures recur. As S. Solis Cohen⁵ states, "success in cases of this kind would seem to require exposure of the interior of the larynx by external division of the thyroid cartilage, and excision of the whole of the cicatricial tissue." In many instances the only recourse is found to consist in the performance of a low tracheotomy, with subsequent permanent retention of the tube. Intubation gives relief in some cases, but if the deformity of the larynx is great it may be very difficult to insert a tube so that it will remain.

One striking, and we might almost say, the only cheerful feature of cases of cicatricial lesions in the larynx is the wonderful manner in which many of them retain their power of phonation. There is a compensatory action of some kind which counterbalances to a great extent even large losses of tissue.

1831 Chestnut St.

Intratracheal Struma—O. FRANKENBERGER—*Monatschr. f. Ohrenh.*, Berlin, Dec. 1904.

The author saw a subglottic tumor in a woman of 41, who was suffering from goitre. She died suddenly, and as no autopsy was performed the nature of the growth was not positively determined.

YANKAUER.

⁵ Diseases of the Throat and Nasal Passages, p. 524.

SOCIETY PROCEEDINGS.

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY.

Tenth Annual Meeting, held in Chicago, Ill., May 30, 31 and June 1, 1904.

NORVAL H. PIERCE, M.D., *President.*

(Continued from June Number, page 592.)

Collodium After Nose Operations.

Dr. KASPAR PISCHEL, of San Francisco, gave a demonstration of the use of this agent, after which he stated that two years ago he published an article on this subject. At the meetings of the German Pathological Society and the London Laryngological Society last year, the question of the operative treatment of the nose was discussed, but the method which he suggested was not mentioned. He thought it was an oversight, as such things must be seen in order for one to appreciate their value.

The after treatment in nose operations, on the septum as well as on the turbinals, had been quite unsatisfactory to him. There was the choice between packing the nose and taking the risk of having a severe hemorrhage. To have the nose packed was very disagreeable to the patient. If the packing was loose, one might have a hemorrhage. If the packing was tight, it sometimes caused such discomfort and pain that the patient could not sleep. He tried different kinds of packing. Iodoform gauze strips soaked in ferropyrine solution answered tolerably well. A surer packing against post-operative hemorrhages was compressed cotton in the form of Dr. Simpson's intranasal tampons. The moisture of the nose made them swell up so that they very effectually prevented hemorrhage, but the pressure was sometimes so great that it caused pain, discomfort and a sleepless night. The removal of the plug also was quite painful, and several times he overlooked some layers which were pressed into the cleft; they stayed there several days, causing some infection through the retention of pus. These disagreeable experiences caused him to look for a cover of the wound which would not close up the nares. He tried carbolized gelatine in 50 per cent solution, which had served him well in small hemorrhages of the

septum, but it did not prove strong enough. For the last ten months he had used collodium to his entire satisfaction. After he was through with the operation (removal of hypertrophy on the lower turbinal, for example), he touched the wound several times with adrenalin to stop the bleeding; then he dropped collodium on the wound, while his assistant blew compressed air into the wound to quicken evaporation. The collodium quickly formed a white firm membrane which fulfilled two purposes. It covered the wound against infection from the air and prevented secondary hemorrhages. As an extra precaution, he asked the patient to keep a little cotton in the entrance of the nose on the way home, but allowed him to take it out at home, so that he might breathe through that nostril. In several cases, to facilitate the sticking and to increase the power of collodium, he put a wisp of cotton on the wound first; after a few days he removed this membrane, which, if left too long, might cause infection by retention. He had now used collodium in thirty-one cases, and had not had one secondary hemorrhage. At first he was afraid collodium would smart too much, but as the nose was under cocaine anesthesia, the patient did not feel anything. The collodium must be dropped on the wound slowly and carefully, so that it will not run down into the pharynx, which would make the patient gag and cough. For dropping the collodium on the wound one might use a fine eustachian catheter, on the wider end of which a small rubber bulb (or dropper) was mounted, fastened air-tight with a rubber band. One filling of the bulb with collodium was usually enough to cover the whole wound. He used a small metal tube, 9 cm. long, 1 mm. thick, with a tulip tip on one end, to fasten the rubber bulb. This tube had to be cleaned out thoroughly after use.

DISCUSSION.

Dr. CHEVALIER JACKSON, in the discussion, said he thought this was a most excellent procedure. He had seen Dr. Day use a similar method for years without a dropper, but this was a technical improvement on that method. After drying it off he saturated a pledget of cotton with collodium and put it in with forceps, and left it in three or four or five days until it loosened itself and came away of its own accord. Secretions did not seem to penetrate it, nor to rot in it.

Dr. JOSEPH C. BECK asked if any gentleman had ever used glutol after operations on the nose. If any of the members would try it, they would find its fixity almost as firm as mouldine, and it was aseptic. General surgeons used it on laparotomy wounds, and had

left them undisturbed. The wound was as clean as could be. Glutol dried out the surface, and that was what they used it for. There was no odor accompanying it. It was better than bismuth or any of the agents usually employed, and it would soak by means of a very warm solution. If one had to loosen it up and used considerable heat in so doing, he might start oozing. He had used glutol with satisfaction. He applied it with an applicator. He moistened the applicator, removed the excess, and the glutol was dried sufficiently to make a coating over the surface. If the surface was far enough anterior, one could use a blower.

The Relation of Diseases of the Stomach to Affections of the Mouth, Nose and Throat. By DR. ROBERT LEVY, Denver, Colo.

He said that a careful review of laryngological literature impressed one with the fact that while there existed a relation between diseases of the upper air passages and those of the stomach, this relationship was not well defined, nor was the interdependence of diseases of the stomach and those of the mouth, throat and nose separated distinctly from affections of the gastro-intestinal tract, and, in fact, from those of the entire digestive system. Many diseases of the mouth, nose and pharynx and accessory cavities resisted treatment directed purely to the relief of the local conditions until measures intended to correct general disorders were instituted. Three positive statements might be made clinically:

1. That certain affections of the upper air passages and their adjacent cavities were causative in a measure of some form of stomach disturbance.
2. That certain stomach disturbances were the cause of certain affections of the upper air tract.
3. That the relationship existing between digestive disturbances and certain diseases of the upper air passages was so close that treatment must necessarily involve attention to both conditions.

Although no direct causative relation could be traced between diseases of the alimentary canal and certain affections of the mouth, they might be and frequently were associated. Among the diseases of the nose, which were more especially associated with gastro-intestinal affections were vaso-motor rhinitis, nasal irritation and red nose. Urticaria of the mucous membrane of the throat was a serious and might possibly be a fatal affection, and was largely dependent upon digestive disturbances, as was well known to be the case in urticaria of the skin. Among the diseases of the larynx

certain nervous affections, such as hyperesthesia and laryngeal spasm, were found attended with disturbed digestion. Although diseases of the stomach could not be said to be indisputably caused by affections of the mouth, nose and throat, or indisputably the result of diseases of these organs, the correlation was so close that successful management of both depended largely upon recognition of this interdependence. This still further emphasized the thought, to which men working in special lines had called attention, that the entire human organism was one intricate mechanism, in which local disorders were frequently but manifestations of constitutional affections.

DISCUSSION.

DR. J. A. STUCKY was very much interested in the relation of naso-pharyngeal disturbances to gastro-intestinal trouble. Undoubtedly, the gastro-intestinal canal had a good deal to do with the nose and throat. Cases of so-called vaso-motor rhinitis and of lithemic naso-pharyngitis, he believed, in a measure, had their origin in the intestinal canal, and in the last two years he had been making some observations in connection with a stomach specialist and microscopist, and found those patients that were sneezing, blowing, hawking and spitting lived a rather indolent life. Most of them were big eaters, great brain workers or society people, who had the handkerchief habit, who complained of rheumatism, general malaise, and were neurotics generally. In these patients he found the urine loaded with indican. His attention was first called to this by Dr. J. McClymonds, and in 123 examinations of the urine in cases such as he had described at the Pittsburg meeting, he found an excess of indican in the urine; occasionally an excess of uric acid, but the uric acid found did not cause as much of the irritation as the presence of indican. He did not know anything about indican. It was said to be the result of absorption of the intestinal contents connected with fecal matter; but he did not know this. The moment he eliminated all of the indican, the moment he got his patient's colon flushed out and the diet regulated, the sneezing and nasal disturbance stopped. Personally, he did not believe that the swallowing of the mucous secreted by the nose and throat had much to do with gastric disturbance, but the trouble began, not in the stomach so much as in the intestinal canal, and one had to clean out the intestinal canal and get the eliminative organs working harmoniously before these patients could be relieved. If they were sent to the country they got better. And why? For two reasons: Send them to the springs and they would drink a great deal more water than they would

at home. They would take a great deal more exercise than they would at home. They went there for a purpose. They did not take as much exercise and drink as much water at home as they did at health resorts. If they did, many of them would do just as well at home as they would at these resorts. However, the drinking of fluids did not relieve the average case, and not until the alimentary canal was thoroughly emptied at both ends were they relieved. He meant by that high enema, using a thirty or forty inch tube, the enema being given at say five o'clock in the evening, and then two or three hours later the same colon tube was used and eight ounces of olive oil was injected. After this treatment the patient would go to sleep. If it was nine or ten o'clock the oil was not passed until next morning, and frequently not then unless a saline was given.

But about the second or third day one would be surprised at the enormous quantity of fecal matter that would be passed, large scybulous masses being passed, with foul odor. He did not succeed in thoroughly clearing out the intestinal canal in one case until the eighteenth day, but usually about the third, fourth, seventh or eighth day these cases began to clear up. The relief was marked. The objection to this treatment was that it required a trained nurse to give the injections properly. These patients were sent to the hospital to remain there for four or five days, if necessary, or else they were to have a trained nurse go to the home. The results of this treatment have been so beneficial and relief so great to the patients that they did not object to the treatment.

Dr. FREDERICK C. CORB said that his own experience agreed with what Dr. Stucky had said. There were a number of naso-pharyngeal cases which seemed to be entirely dependent upon digestive disturbances; but the complications which occurred in digestive disorders were far beyond anything one could find out without special study. He had often referred these cases to a stomach specialist, and the results obtained had been much better than if he had tried to treat them himself. Cases that did not yield to cauterization and clearing of the nasal cavities very thoroughly showed a startling improvement as soon as attention was given to the gastro-intestinal tract. These cases in his experience usually had gastro-intestinal symptoms, such as dyspepsia, diarrhea, constipation, etc., and unless treatment was directed to the stomach and intestines, as well as to the local conditions, the results were not satisfactory.

Dr. WM. L. BALLENGER saw a case some years ago which illustrated one of the diseases Dr. Levy mentioned in his paper as being

due to stomach disturbance, namely, acute circumscribed edema of the pharynx and larynx and of the fauces.

A young lady, living north of his place some miles, started for the city to attend a theater. When she left home she complained of slight headache. Before she had traveled more than four miles by train she began to feel a sense of suffocation, and she came to him on account of her acute symptoms of suffocation. Upon examination he found the fauces, uvula, and large portions of the lateral walls of the pharynx and epiglottis very edematous, apparently large urticarial wheels or edematous areas being present. Dyspnea was very marked. Cyanosis was somewhat noticeable; her mental distress was extreme. The first thing he did was to assure her that she was not in danger, and that if she remained calm she would soon get her breath again, and any danger would disappear. He then proceeded to scarify the edematous areas and apply astringent remedies, such as he happened to have at home, and among them used cocaine. In a few minutes she was greatly relieved, and in a few days the edema had entirely disappeared. There was also very marked nasal disease in this case in the way of septal deformities and turbinal enlargements. Furthermore, the young lady was intensely neurotic. The affection might not have been stomachic in origin, although this was quite probable, as her family physician, an able man, so diagnosed her case. He recognized urticaria in other parts of the body as being suggestive, having its origin in the digestive tract or faulty digestion, or faulty metabolism, and in this case it was quite probable it was the principal cause of the digestive disturbance. Patient had eaten largely of strawberries some hours previous to the attack. She had subsequently slight attacks of edema. He reported this case to the Chicago Academy of Medicine several years ago. His thesis for Fellowship in the Academy was based on this case. He described the case as one of acute circumscribed edema of the fauces and throat.

In general, he believed there was a close relationship in many cases between pharyngeal diseases and the hyperesthetic types of rhinitis and diseases of the gastro-intestinal tract. He recognized, however, the great difficulty in establishing positive evidence to prove this relationship. Conclusions had to be based chiefly upon data rather than on any positive proof. If one would read Frederick's review of this subject, he would find that his conclusions were to that effect; that while there was a large amount of literature being written on the subject, there was little positive evidence existing to show such relationship. Clinically, however, it was very well

established that there was such a relationship and they were interdependent. Some cases of stomach disturbance were undoubtedly due to nasal or throat disease, whereas in other cases the nasal or throat diseases could be ascribed to intestinal diseases.

Dr. J. A. STUCKY added a word or two to what he had already said with the permission of the Society. He feared that he did not make himself clear in his previous remarks. Undoubtedly in some of these cases the urticaria was due to gastric irritation. But there was one experiment he had made on four or five cases that proved something, he thought. Dr. McClymonds, a stomach specialist in Lexington, had washed out the stomach in these cases, and in many of them it was not followed by relief, as the sneezing and irritation had continued. But the moment the alimentary canal was washed out relief was afforded. He thought this proved something. One patient he had, who, if she drank a cup of coffee and ate a plate of icecream, within an hour or two had a stuffy headache, sneezing, and an asthmatic cough. On three different occasions he had her stomach washed out to see whether the trouble was there within two hours after eating, and he found coffee and ice-cream. Then a high enema was given; the lower bowel washed out, a saline administered, all of which consumed an hour. The case was perfectly relieved. In four or five other cases he had tried the same experiment with good results. His observation had been that toxemia resulted from the absorption of the bi-products from the intestinal canal, and not from the stomach.

The Treatment of Chronic Empyema of the Antrum of Highmore

—HERM. CORDES—*Monatschr. f. Ohrenh.*, Berlin, Jan. 1905.

Cordes has treated a considerable number of cases by making an opening in the inferior meatus with a curved trocar, irrigating the sinus and then blowing iodoform powder into it through the trocar. He claims 83.3% cures in from three to nine months. The cases which were not cured by this simple treatment were then operated by a modified Caldwell-Luc operation and were cured, so that the author succeeded in curing all his cases of chronic antrum suppuration.

YANKAUER.

ABSTRACTS.

The Submucous Window Resection of the Nasal Septum—E. EDWIN FOSTER (New Bedford, Mass.)—*Journ. Eye, Ear and Throat Dis.*, Jan.-Feb., 1905.

This is mainly a translation of Killian's own description of his operation, and it is desired to merely direct attention to it as a remarkably clear and concise statement of what appears to be the simplest and best operation of its kind.

EATON.

A Case of Nervous Gagging after Tonsillotomy—E. BERGH—*Monatschr. f. Ohrenh.*, Berlin, Dec., 1904.

After the removal of large tonsils and adenoids from a nervous girl seven years old, the patient was seized with attacks of gagging, which persisted for three days. After each attack, there was severe hemorrhage from the nose and throat so that the patient was almost exsanguinated. The treatment consisted in the application of strychnine to the naso-pharynx and fauces.

YANKAUER.

A Case of Gangrenous Pachymeningitis—EDWARD RICHTER—*Monatschr. f. Ohrenh.*, Berlin, July, 1904.

The patient, a young man 17 years old, had suffered from otorrhoea for two years. He was suddenly taken with a chill, rise of temperature, vertigo, vomiting and prostration. The external ear, the side of the head and neck and mastoid region became intensely swollen and painful. Upon incising the skin over the mastoid, a large quantity of brown, fetid fluid escaped from beneath the periosteum of the occipital bone, and from numerous fistulous passages leading down into the fascia of the neck. The mastoid was carious, and the dura was separated from the petrous portion of the temporal bone as far as the apex. The dura was greenish black in color. All the abscess cavity was filled with sloughs and intensely fetid pus. The wound was packed with gauze soaked in Aqua Picis, and was sprayed with a spray of peroxide of hydrogen and compressed oxygen gas. The patient eventually recovered.

YANKAUER.

BOOK REVIEW.

The Accessory Sinuses of the Nose. By Dr. GUSTAV KILLIAN, Professor of Laryngology and Rhinology in the University of Freiburg, im B.; translated by D. R. Paterson, M. D., M. R. C. P., Assistant Physician in charge of Throat Department, Cardiff Infirmary. One Quarto Volume, illustrated by fifteen colored plates, made from special drawings by Herr Schilling. Publisher, W. T. Keener & Co., 90 Wabash Ave., Chicago, Price, \$7.50 Net.

The appearance of this atlas with English text makes more accessible to American readers a work which received immediate recognition by European reviewers and specialists on its first publication in German.

The work is the result of a discovery by Prof. Killian that, in specimens preserved in formalin, the membranous lining of the Accessory Sinuses of the Nose becomes firm and elastic, so that the original form and position are preserved even when the bony support is entirely removed. Using this discovery, Prof. Killian planned and executed a series of preparations of the Accessory Sinuses of the Nose and neighboring structures. In order to retain the bony landmarks he resorted to the method of fenestration. Accordingly, while each preparation showed perfectly the sinuses, the relations to other structures was retained. The fifteen preparations are arranged to show the sinuses from all aspects; and, at the same time, their relation to the important neighboring organs is made clear. Each preparation presents a different phase.

The work of reproduction was done by Herr Schilling. The fifteen plates in color are beautifully executed and represent the design of the original preparations very clearly. In order not to mar the illustrations, each plate is accompanied by an outline on transparent paper on which the necessary notes and designations appear. The English text is a liberal translation of the original. It describes each plate separately and completely so that it may be studied without the inconvenience of constantly referring to other portions of the book.

The atlas will appeal to all those engaged in work on the Sinuses and adjoining organs. The workers in brain surgery, neurology and ophthalmology as well as the rhinologist, will find it a very valuable book for their specialties. B.

